EN

USE AND INSTALLATION MANUAL

PRACTIKA 28 - 33

COD.8901112700

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General information

The user is NOT permitted to service this boiler.

The manufacturer cannot be held liable for personal injury, harm to animals or property damage resulting from failure to observe the instructions contained in the manuals supplied with the boiler.

1. GENERAL INFORMATION

1.1. Symbols used in this manual

When reading this manual, pay particular attention to the parts marked with symbols. These symbols are used to give the following warnings:

DANGER!

Serious risk to safety and to life

CAUTION!

Potentially hazardous situation for the product and the environment

NOTE!

Recommendations for users

1.2. Proper appliance use

The instruction manual is an integral and essential part of the product and must be kept by the user or system manager.

Read the warnings contained in the manual carefully, since they provide important information about safe installation, use and maintenance.

Keep the manual in a safe place for future reference.

Installation and maintenance must be performed in compliance with the applicable regulations according to the manufacturer's instructions and by qualified personnel trained pursuant to the law.

Incorrect installation or improper maintenance could cause personal injuries, harm to animals or property damage, for which the manufacturer will not be held liable.

Before carrying out any cleaning or maintenance operations, disconnect the appliance from the mains power supply using the system switch and/ or the relevant external components and turn off all taps.

If the appliance has a fault and/ or is not operating correctly, switch the appliance off and do not make any attempt to repair it or service it directly. Contact only authorised staff. Any repairs to products must be carried out using only original spare parts. Failure to observe the above recommendations may compromise the safety of the appliance.

If the appliance is sold or transferred to a new owner or the owner moves, leaving the appliance in situ, always ensure that the manual is kept with the appliance so that it can be consulted by the new owner and/ or fitter.

For all appliances with optionals or kits (including electrical kits) use only original accessories.

This appliance must be used only for the use expressly intended. Any other use is to be considered incorrect and therefore dangerous.

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The PRACTIKA appliance was built according to the latest technologies and in accordance with the applicable technical safety regulations.

Nonetheless, the incorrect use of the appliance may result in hazards and also endanger the user or others, or even damage the device or other objects.

The appliance is intended for the operation of hot water heating systems.

Appliance use in accordance with the envisaged purposes includes scrupulous observance of the instructions provided in this manual.

RED reserves the right to make any changes to the design and factory settings of the burner and hot water boiler without having to inform the end users of such changes.

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2. GUARANTEE TERMS

The Manufacturer guarantees the product, with the exception of parts subject to normal wear specified below, for two years from the date of purchase, provided that proof of purchase is supplied in a document specifying the name of the retailer and the date the sale was made and that the completed guarantee certificate was sent within 8 days of said purchase. The product must also be installed and tested by a specialised fitter and in accordance with the detailed instructions provided in the instruction manual that accompanies the product.

The guarantee covers the replacement or free repair of parts recognised as being faulty at source due to manufacturing defects.

2.1. Warnings

- Installation, electrical connection, functional check and maintenance of this appliance must only be performed by qualified or authorised personnel.
- This appliance must not be used by anyone (including children) with reduced physical, sensory or mental skills and with little experience and knowledge, unless they are supervised or have been instructed to use the appliance by the person in charge of its safety.

The guarantee applies, provided that:

1. The boiler is installed, in accordance with the applicable standards in force and the instructions provided in the product use, maintenance and installation manual, by legally qualified staff (Italian Ministerial Decree no.37 of 22nd January 2008);
2. The customer holds the documentation certifying its suitability in all parts:
    a. INSTALLATION REPORT – filled in by the fitter
    b. TEST REPORT and GUARANTEE APPLICATION – filled in by an authorised serviceman
3. The guarantee is valid from the date on which the boiler is first started up (which must be indicated in the boiler manual) or from the invoice date. This documentation must be presented to the authorised service centre in the event of servicing.

2.2. Exclusions

The guarantee does not cover any parts found to be faulty due to negligence or inappropriate use, incorrect maintenance, or installation not performed in compliance with the manufacturer's instructions. The manufacturer will not be held liable for any damage which may - either directly or indirectly - be caused to persons, animals or property resulting from failure to observe all the instructions provided in this manual and, specifically, concerning the warnings regarding installation, use and maintenance of the appliance.

The guarantee is not valid if:

1. The terms for implementing the guarantee were not observed.
2. Installation was not performed in observance of the applicable standards in force and the instructions provided in the use, maintenance and installation manual.

The guarantee does not cover:

1. Damage caused by atmospheric, chemical or electrochemical agents, incorrect product use, natural disasters, electrical shocks, fires, faults in the electrical system, modifications to or tampering with the product and/ or other causes not ensuing from product manufacturing
2. Damage caused by normal corrosion
3. Damage relating to the combustion chamber

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4. Damage to seals, claddings, painted/ chromed parts, handles and electrical wires
5. Damage to masonry work
6. Damage to parts of the system for the production of DHW not supplied by RED
7. Damage to the heat exchanger if a suitable condensation-proof circuit is not set up to guarantee a minimum boiler return temperature of at least 55 °C.
8. Servicing for product calibration or adjustments
9. Incorrect or negligent use.
10. All damage caused by transport. We therefore advise you to check goods carefully upon receipt, notifying your retailer immediately of any damage and noting this on the delivery note and on the copy retained by the carrier.

Please contact your retailer and/ or local importer in the event of product failure.

RED will not be held liable for any damage which may - either directly or indirectly - be caused to property, or personal injury or harm to animals ensuing from failure to observe all the instructions provided herein and the applicable regulations regarding installation, use and maintenance of the appliance.

The parts replaced will be guaranteed for the remaining guarantee cover period starting from the original date of purchase of the product.

2.3. Additional clauses:

If faulty or malfunctioning parts are detected during normal product use, these will be replaced free of charge ex retailer who made the sale or ex our local technical service centre.

For products sold abroad, the same circumstances will again result in free replacement, ex our retailer, with the exception of specific conditions agreed upon at the time of negotiations with the foreign distributor.

In the case of replaced parts, the guarantee will not be extended.

No damages are awarded for the product downtime period.

This is the only applicable guarantee and no-one is authorised to provide any other guarantees in the name of or on behalf of RED.

2.4. Liability

RED will not pay any compensation for direct or indirect damage caused by or dependent upon the product.

2.5. Court with jurisdiction

In the event of any controversy, the court with jurisdiction is the Court of Pordenone (Italy).

2.6. Liability exclusion

The manufacturer is unable to supervise the observance of the instructions provided in this manual, nor the conditions and methods of installation, operation, use and maintenance of the product. Incorrect installation could cause damage and endanger persons. Consequently, we cannot be held in any way liable for losses, damage or costs ensuing from incorrect installation, incorrect functioning and improper use and maintenance or in any way connected to the latter. Similarly, we will not be held in any way liable for any violations of patents or third party rights ascribable to the use of this product.

The Manufacturer reserves the right to make any changes to the product, technical specifications or to the manual without notice.

If hazard-free operation is no longer possible (for instance, due to visible damage), turn off the appliance immediately.

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2.7. Service call

The service call must be made to the retailer or service centre.
The manufacturer cannot be held liable if the product and any of its accessories are used incorrectly or modified without authorisation.
Only original spare parts must be used for replacements.

2.8. Installation standards

The Practika boiler is designed to run on wood pellets.
It must be installed according to the provisions of the following standards:
Italian Law Decree no. 93 of 25th February 2000
Implementation of Directive 97/23/EC (P.E.D.) on the subject of pressure equipment.
SCOPE OF APPLICATION liquid fuel (naphtha, gas oil, fuel oil) and solid fuel operated appliances.
ITALIAN LAW of 5th March 1990 no. 46 and related applicative regulations Italian Ministerial Decree no. 447 of 6th December 1991 (and subsequent amendments) and **Italian Ministerial Decree no. 37 of 22nd January 2008**
System safety standards
SCOPE OF APPLICATION: without limits to heat potential.
Standard UNI 10847 of 03/2000
Single flue systems for liquid and solid fuel generators. Maintenance and control. Guidelines and procedures.
SCOPE OF APPLICATION: liquid and solid fuel operated systems.
ITALIAN LAW of 9th January 1991 No. 10 and related applicative regulations Italian Ministerial Decree no. 412 of 26th August 1993 (and subsequent amendments), Italian Ministerial Decree no. 551 of 21st December 1999.
Regulations specifying amendments to Italian Presidential Decree 412 on the subject of planning, installing, running and servicing heating systems in buildings for the purposes of limiting energy consumption.
SCOPE OF APPLICATION: without limits to heat potential.
ITALIAN LAW NO. 186 of 01.03.1968
Installation standard CEI 64-8 / II ed.
Electrical utility systems at a nominal voltage of no more than 1000 V in alternating current and 1500 V in direct current.
Installation standard CEI 64-8 / I ed.
Electrical utility systems in buildings intended for residential and similar purposes.
Standard UNI 10683 of 09/2005
Systems running on wood or other solid biofuels.
Installation requirements
SCOPE OF APPLICATION: systems running on wood or other solid biofuels with a heat decomposition power of the combustion chamber below 35 kW.
The installation procedure for the system consisting of a pellet boiler and pellet burner requires the scheme for the heating system, prepared in accordance with the standards and local recommendations in force, as follows:

- For the heating system - **EN 303-5/2000** - "*Boilers for heating. Part 5: Heating boilers for solid fuels, hand and automatically stocked, nominal heat output of up to 300 kW. Terms, requirements, tests and marking*".
- Local requirements for the flue connection.
- Local requirements for fire-prevention standards.
- For the power circuit - **EN 60335-1/1997**- "*Safety of electrical appliances for domestic and similar use, Part 1 – General requirements*".

This appliance must be installed in accordance with the provisions of the applicable standards in force in the country of installation of the boiler.

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3. TECHNICAL SPECIFICATIONS AND DIMENSIONS

3.1. Technical specifications

The hot water pellet boilers in the "PRACTIKA" range are pellet boilers for the production of hot water with a steel structure, which use solid biomasses in the form of pellets as fuel. The boiler is designed for connection to hot water heating systems.

The "PRACTIKA" hot water pellet boiler system includes:

- *hot water boiler – 1 (one);*
- *automatic pellet burner - 1 (one);*
- *ash tray – 1 (one);*
- *lower cap (for the cleaning section between the secondary and tertiary combustion gas ducting) – 1 (one);*
- *ceramic elements – 2 (two);*
- *fin – 1 (one);*
- *flap support – 1 (one);*
- *cleaning kit (rake – 1 [one], hook – 1 [one]);*
- *electrical connectors - for the room thermostat – 1 (one), for the smoke extractor fan - 1 (one);*
- *power supply cable – 1 (one);*
- *M10 nut and washer – 2 (two);*
- *instruction manual - 1 (one);*
- *boiler manual – 1 (one);*

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3.2. Description of the Practika 28-33 hot water boiler and automatic pellet burner

The system consists of:

- Hot water pellet boiler
- Automatic pellet burner

3.3. Description of the “Practika” hot water pellet boiler heat exchanger

The "PRACTIKA" hot water pellet boiler heat exchanger complies with the operating requirements of this type of appliance, as set out in the operation standard: ***EN 303-5/2000 –***

The hot water boiler consists of the following elements/modules:

- The main component of the hot water boiler is the **heat exchanger**, which features a side opening for the installation of the pellet burner. The heat exchanger is manufactured in two versions - "**left**" – with the pellet burner installed on the left (looking at the boiler from the front) and "**right**" – where the burner is installed in the opening of the heat exchanger on the right (again looking at the boiler from the front).

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- The **heat exchanger** is a welded structure of steel plates. The front section of the heat exchanger consists of a combustion chamber, beneath which the ash tray is situated. The heat exchanger is a relatively compact structure and it was designed like the so-called "three-way heat exchanger" - the combustion gases are ducted from three into to one. This design affords intensive heat exchange and relatively contained overall dimensions for the system.
- **Ceramic elements,** installed in the combustion chamber, which ensure the best conditions for the combustion process to take place and efficient use of fuel.
- **Ash tray** situated at the bottom of the combustion chamber. It collects all ash residue and makes for easy cleaning of the heat exchanger surfaces of the boiler.
- **Inlet and outlet openings** for the water circulating in and out, situated at the back of the boiler and with female threaded unions (internal), G1½", used to connect the boiler to the heating system.
- **The outlet aperture** is a female union with an (internal) G½" thread, which must be fitted with a vent valve.
- **The opening for the combustion gases** is situated at the top of the back of the boiler, and has a diameter of 150 mm. It must be connected to the chimney flue.
- **Alarm thermostat** protecting the boiler against overheating.
- **Pressure gauge.**
- **The external covers** of the boiler are made from steel.

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3.4. System technical details

The heat and technical details of the system consisting of pellet boiler and pellet burner using wood pellets:

Parameter	**Measurement unit**	**Value**	
Hot water pellet boiler model		**PRACTIKA 28**	**PRACTIKA 33**
Pellet burner model		**BURNER 28**	**BURNER 33**
Nominal heat output	kW	25	30
Operating range (min-max)	kW	7,5-25	9-30
Fuel used	• Wood pellets • Pre-dried cherry stones • Other dried stones		
Consumption rate (min-max)	kg/ora	1,7-6,0	2,0-7,2
Fresh air rate, required for the effectiveness of the combustion process and of the boiler operation	kg/hour	45-50	57-64
	m^3/h	39-44	50-56
Average wood pellet consumption rate (the boiler operates in a normal heating system)	kg/hour	4.1	4.9
Heating efficiency(min-max)	%	91-89	93-89
Excess air ratio	λ	1.5-1.7	
Temperature of combustion gases at the nominal heat output	°C	180-200	
Solid fuel residue	Ashes	The quantity depends on the ash contents of the raw fuel, as well as on the operating conditions	

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The dimensions and technical details of the system consisting of pellet boiler and pellet burner using wood pellets:

Parameter		**Measurement unit**	**Value**	
Hot water pellet boiler model			**PRACTIKA 28**	**PRACTIKA 33**
Pellet burner model			**BURNER 28**	**BURNER 33**
System weight		kg	210	220
Boiler water jacket capacity		dm^3	50	60
Overall dimensions of the system (WxDxH)	**W** - Width	mm	951	1011
	D – depth		768	768
	H - height		962	1042
Boiler class (according to EN 303-5)		-	3	
Operating pressure		bar	1.5	
Factory tested pressure		bar	4	
Recommended temperature for the water circulating in the boiler		°C	80	
Minimum mandatory temperature of the water returning to the boiler		°C	60	
Draft		Pa	25-30	
Connections	Flow/return rate	G	1 and 1/2″	
	Outlet	G	½″	
	Combustion gas duct	mm	150	
Power supply		-	50 HZ; 230V AC	
Electrical capacity		VA	<100 + 1100 (at start-up)	
Electrical protection		-	IP20	

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The following figures show the dimensions and structure of the system modules:

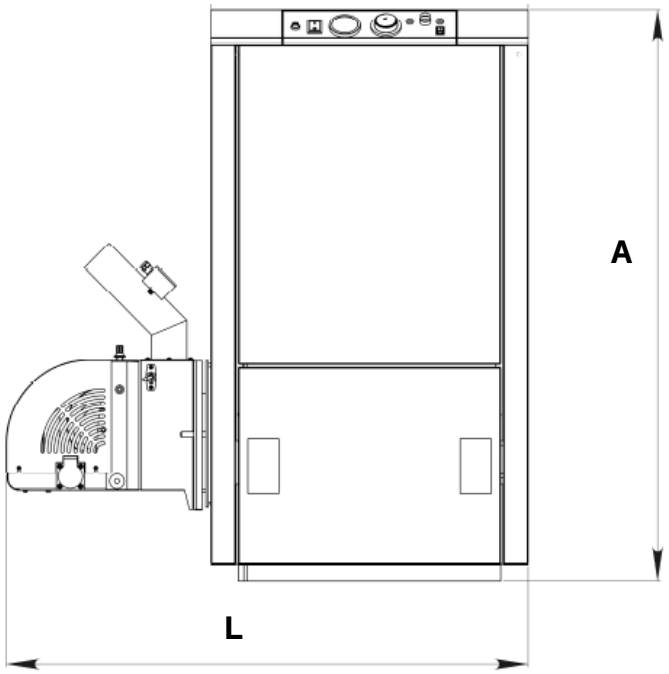

Figure 3.4.1 Front view with burner on the left

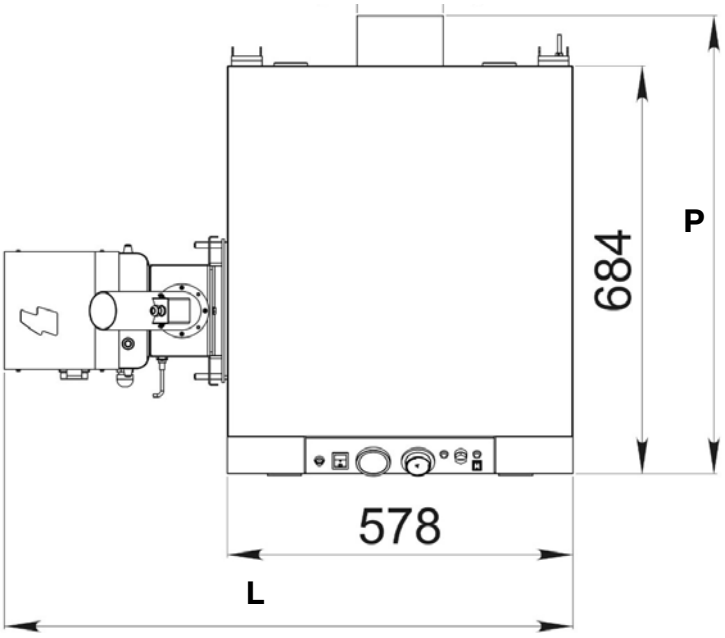

Figure 3.4.2 Top view with burner on the left

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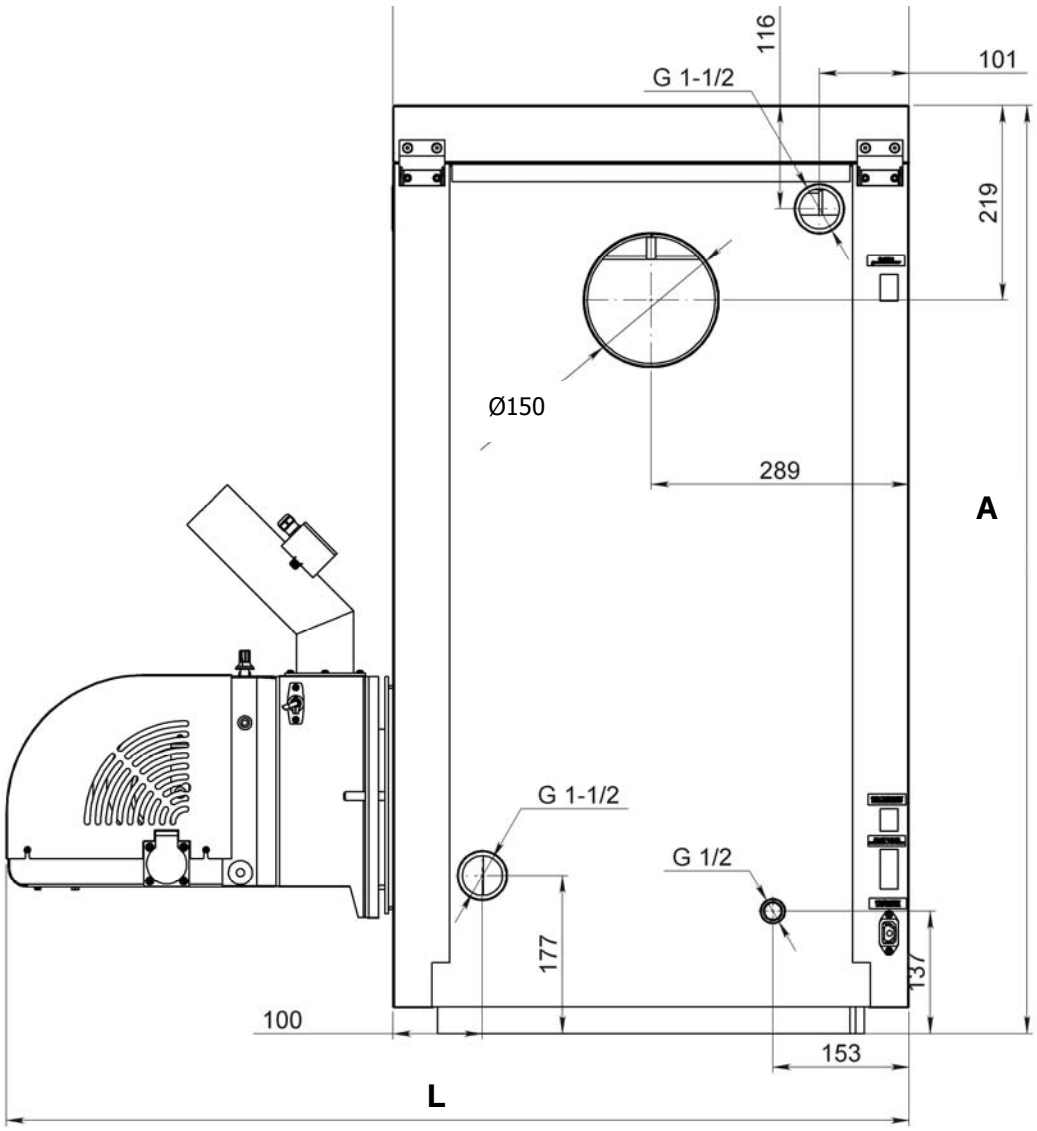

Figure 3.4.3 Rear view with burner on the right

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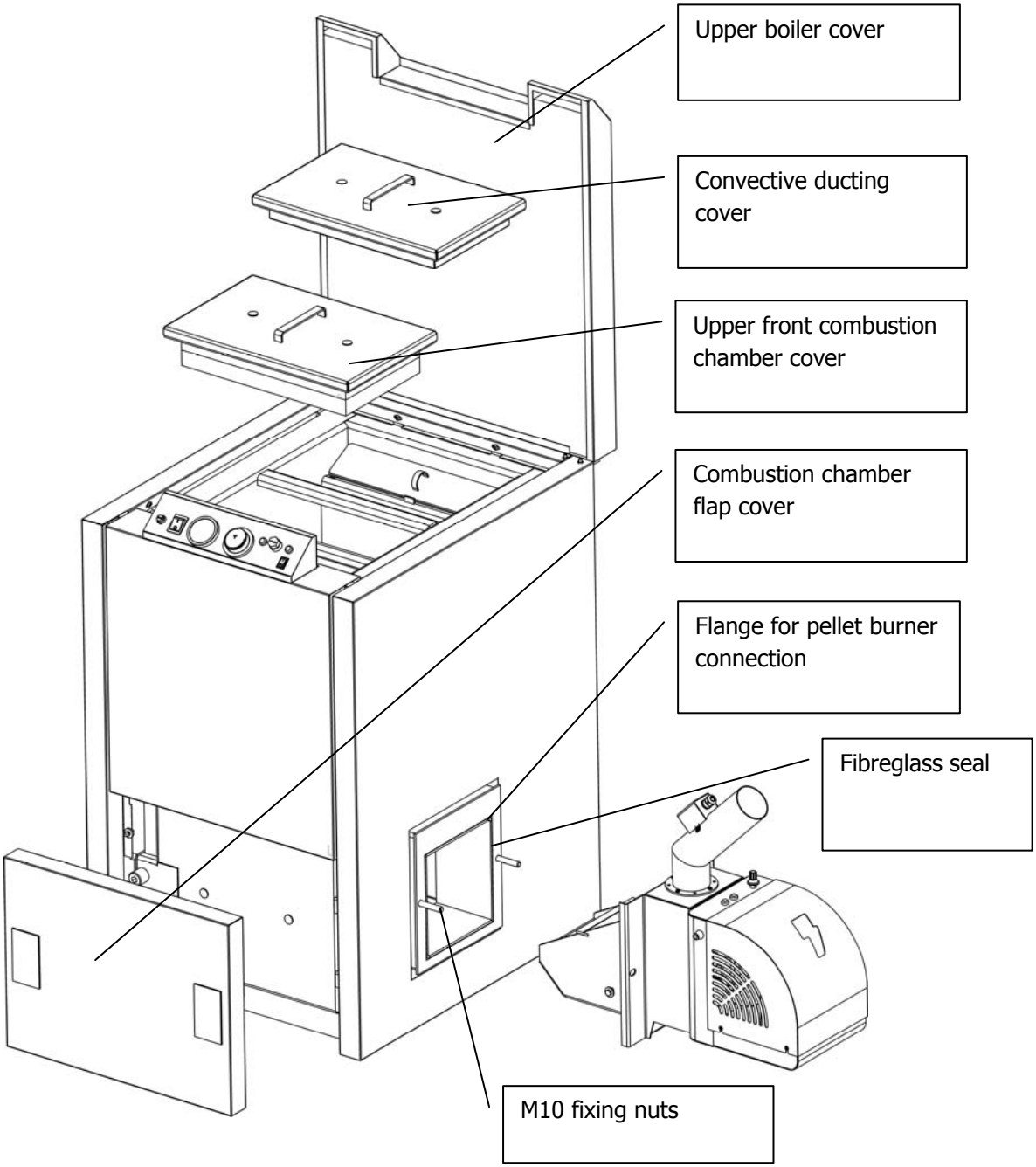

Figure 3.4.4 View of the pellet boiler with burner on the right

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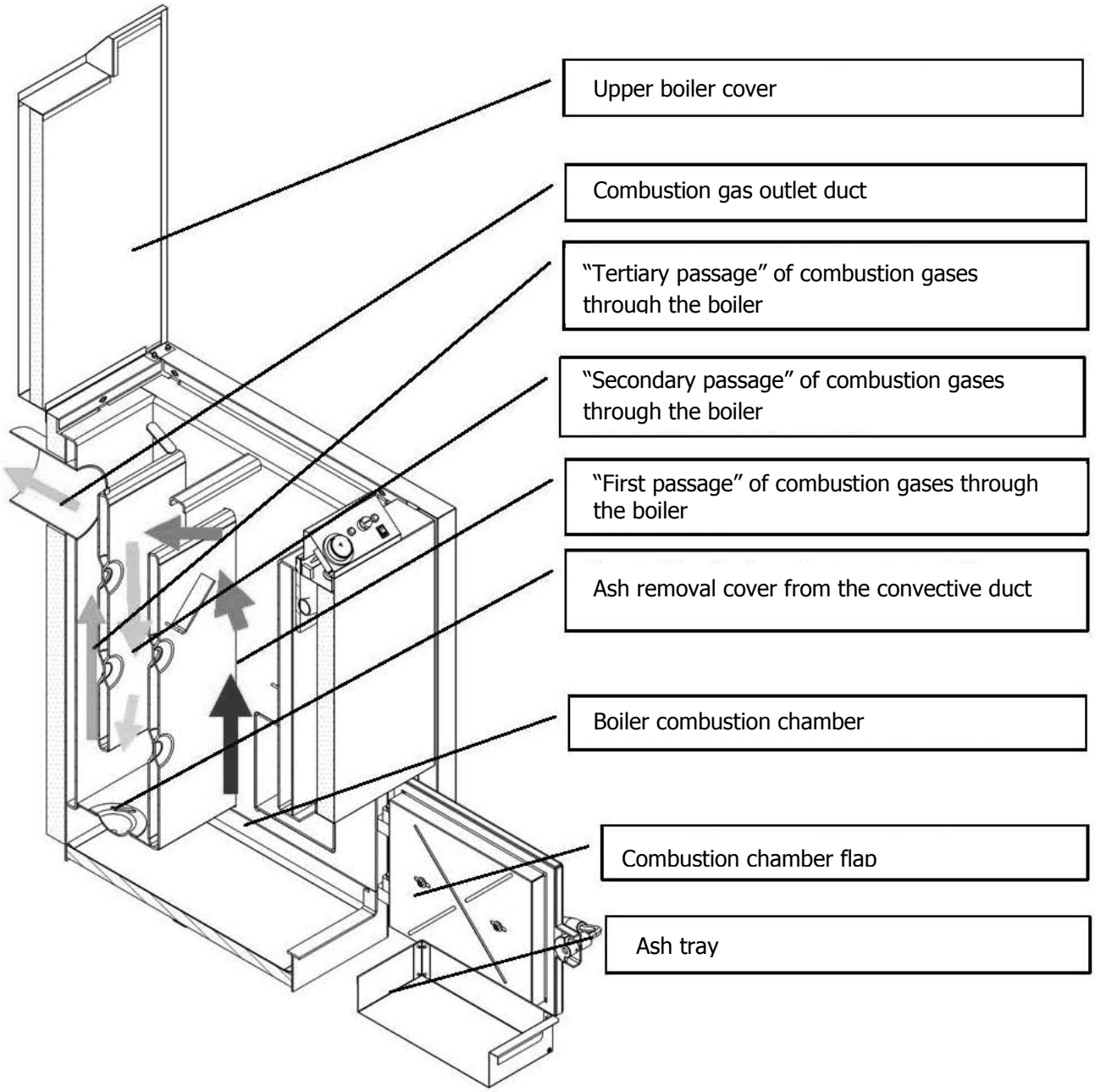
Upper boiler cover
Combustion gas outlet duct
"Tertiary passage" of combustion gases through the boiler
"Secondary passage" of combustion gases through the boiler
"First passage" of combustion gases through the boiler
Ash removal cover from the convective duct
Boiler combustion chamber
Combustion chamber flap
Ash tray

Figure 3.4.5 Cross section of the pellet boiler (the passage of the combustion gases is depicted schematically, the main components of the heat exchanger are indicated, and the connection of the burner is depicted on the right).

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3.5. Information for using pellets

The main characteristic of the boiler is that it burns a natural fuel (pellets) obtained ecologically from wood industry waste (sawdust, chips). The sawdust and chips obtained from wood machining are first suitably cleaned and dried, and then compacted at very high pressure to produce small nuggets of pure wood, i.e. pellets.

It is an absolutely ecological fuel since it does not use any glue to keep it compact. Indeed, the compact nature of pellets over time is ensured by a natural substance found in wood: jet (or lignite).

Each pellet can vary in length and thickness, between 1÷3 cm in length and 6÷8 mm in diameter respectively. The main characteristics of pellets are their low humidity (below 12%). Their high density (approx. 600 kg/m^3) and regular compact texture give this type of fuel properties of high calorific value (NCV 4100÷5000 kcal/kg).

In order to prolong the life cycle of the boiler, RED recommends the use of good quality pellets.

The pellets to be used to power the boiler must have high quality characteristics, such as those set out in standards DIN 51731 and ÖNORM M7135.

It is vital that you check regularly that there are some pellets left inside the tank to avoid them running out completely and therefore the boiler shutting off.

WARNINGS

The use of poor quality pellets or of any other inappropriate material could damage certain components of the boiler and jeopardise its correct functioning: this could render the guarantee null and void, and relieve the manufacturer of any liability. RED encourages users to use pellets which comply with the characteristics set out herein above.

3.6. Basic fuel requirements

- The fuel, in the form of pellets, must be dry. The appliance manufacturer recommends that the fuel is kept in dry, well aired premises.
- It is strictly forbidden for the fuel to be kept near the system (either the boiler or the burner); the minimum safety clearance between the fuel and the appliance is **400 mm**.
- The system manufacturer recommends an optimal distance between the boiler and the fuel tank of at least **1000 mm**. It is advisable for the fuel to be kept in a room close to the one where the boiler is installed.
- The fire prevention regulations must be taken into consideration during the system installation procedure and during the fuel storage. It is also recommended that a fire extinguisher be fitted in a safe and easily accessible place.

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4. INSTALLING A "PRACTIKA" HOT WATER BOILER

4.1. General warnings

- This boiler must only be used for the use expressly intended. Any other use is to be considered incorrect and therefore dangerous.
- This boiler is designed to heat water
- These appliances are designed solely for installations in suitable rooms or technical premises. Consequently, these appliances cannot be installed and operated outdoors. Outdoor installation could lead to malfunctions and hazards. For outdoor installations, we advise you to choose an appliance designed specifically for this purpose.
- The boiler must NOT be used by children or unassisted persons with limited abilities.
- Do NOT leave any packaging components within the reach of children or persons with limited physical, sensory or mental skills or with little experience and knowledge.
- Do NOT touch the boiler while bare foot and with wet or damp body parts
- The venting apertures are vital for correct combustion
- After a period of inactivity, check for any obstructions before starting the boiler.
- Do NOT block or reduce the size of the venting apertures of the room where the boiler is installed
- Do NOT pull, detach or tamper with the electrical wires protruding from the boiler, even when the boiler is disconnected from the electricity supply.
- Caution: some parts of the boiler can get very hot. You are therefore advised to wear suitable heat protection.
- Do NOT modify the safety or regulating devices without the manufacturer's authorisation.
- The door to the combustion chamber MUST remain shut during normal product operation
- The boiler was designed to operate in any weather, yet in the case of adverse weather (strong wind, ice), the safety systems may be triggered and shut off the boiler. If this is the case, contact the service centre and do not override the safety devices.
- In the event of fire in the flue pipe, call the fire brigade.
- If the boiler shuts down, for reasons other than routine maintenance, call the service centre.
- Before making the boiler connections, have professionally qualified staff perform the following:
  a) Clean thoroughly all system piping to remove any residue or impurities which could compromise the correct functioning of the boiler
  b) Check that the chimney flue/flue pipe has a suitable draft, is free of any kinks, and that no outlets from other appliances are introduced there.
- The appliance must be installed by a qualified fitter with the required technical and professional qualifications pursuant to Italian Law 46/90 and to Italian Ministerial Decree no. 37 of 22nd January 2008 who, under his own responsibility, shall guarantee compliance with the regulations of good practice.
- The boiler must be connected to a heating system and/or to a domestic hot water production network, compatibly with its performance and power.

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4.2. Packaging

The boiler is delivered complete with all electrical and mechanical components and it is factory tested.

The boiler must always be handled vertically, using manual or mechanical cranes, which can lift the pallet on which it is packaged or the boiler itself directly.

Take special care not to damage electrical or mechanical parts, with shocks or water sprays once the protective packaging has been removed.

- After removing the packaging, make sure the boiler is complete and undamaged
- If in doubt, contact the retailer
- The document envelope contains:
  - System manual
  - An instruction manual for installation, use and maintenance
  - Appendix G - Technical inspection report for heating system with an output of less than 35 kW
  - Guarantee

4.3. Boiler room

Make sure the room complies with the requirements and characteristics set out in the applicable regulations in force. It is also necessary for the room to provide at least as much air as is required for regular combustion. It is therefore necessary to make holes in the walls of the room, which comply with the following requirements:

- Have a free cross-section of at least 6 cm^2 for every 1 kW (859,64 kcal/h). The minimum cross-section of the opening must nevertheless never be less than 100 cm^2. The cross-section can also be calculated using the following ratios:

  $S = K * Q \geq 100\ cm^2$

  Where "S" is expressed in cm^2, "Q" in kW, "K" = 6 cm^2/kW
- The opening must be situated at the bottom of an external wall, preferably opposite the one where the combustion gases are vented.

4.4. Connection to the flue pipe

For the connection of the flue outlet pipe, local and national regulations must be observed (see Standards UNI 7129 and UNI 10683).

A flue pipe must comply with the following requirements:

- It must be made of waterproof material resistant to the temperature of the smoke and related condensation
- It must ensure sufficient mechanical resistance and weak heat conductivity
- It must be perfectly sealed, to avoid the cooling of the flue pipe itself.
- It must be arranged as vertically as possible
- Chimneys both old and new, built without observing the above specifications may be conveniently recovered by "intubating" the chimney itself. This means a metal flue shall be inserted inside the existing chimney and the space between the metal flue and the chimney shall be filed with suitable insulation.
- In order to prevent the wind from creating pressure areas around the chimney that prevail over the rising force of the combustion gases, the outlet aperture must be positioned at least 0.5 metres

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above any structure adjacent to the chimney itself (including the ridge of the roof) at least 8 metres away.

- The fluepipe must have a diameter of no less than the boiler union; for flue pipes with a square or rectangular cross-section, the internal cross-section must be increased by 10% compared to the boiler union.
- The useful cross-section of the flue pipe can be calculated using the following formula:

  S = K x P/√H

  S ensuing section in cm^2

  K reduction coefficient:0.045 for wood

  P boiler output in kcal/h

  H height of the chimney in metres, measured from the flame axis to the outlet of the chimney into the atmosphere. When sizing the flue pipe, please take into account the actual height of the chimney in metres, measured from the flame axis t the top, decreased by:
- 0.50 m for every change in direction of the union duct between the boiler and the flue pipe
- 1.00 m for every metre of horizontal development of the union itself.

- **We recommend the sole use of outlet ducts which are suitable for the type of fuel used. The supplier will not be held in any contractual and non-contractual way liable for damage caused by installation and usage errors and in any case due to failure to observe the instructions provided by the manufacturer of the appliance.**
- **The products of combustion of the boiler cannot be discharged in collective flue ducts.**
- **The correct installation of the flue duct is necessary to encourage the normal flow of smoke from the combustion chamber to the outside in the event of an electrical power failure.**
- **Remember that a draught of 25-30 Pa must be guaranteed.**

Below are the main characteristic traits of the flue duct according to the provisions of standards UNI 7129 and UNI 10683:

- The smoke outlet must be equipped with inspection valves;
- The minimum height of the pipe directly connected to the smoke outlet of the boiler must be between 2÷3 m;
- If the presence of a horizontal section is necessary, we recommend that the same is of a maximum length of 1.5 m and with a slope gradient of 3÷5% to encourage the smoke to flow away;
- **Use of a wind-proof and rain-proof terminal** to avoid changing the slight overpressure inside the flue pipe (we recommend you end the flue pipe with a horizontal section);
- The outlet ducting must be made with suitable materials which can withstand the products of combustion and any condensation of the same (the inspection valve can allow any condensation that has formed to be vented);
- The ducts must be built to ensure maximum seal against smoke (UNI 10683);
- We recommend you insulate the duct, especially on the outside part exposed to the weather.

Avoid installing completely horizontal sections.

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The room where the heat generator is to be installed must not contain any existing or envisaged smoke suction hoods in order to avoid depressurising the setting.

The air intakes must not be closed.

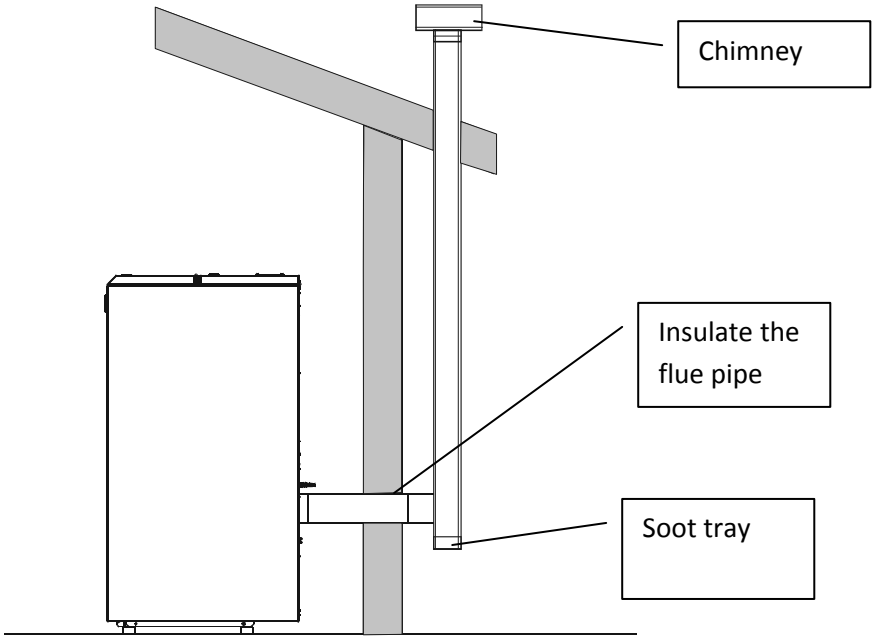
Make sure the flue pipe is kept clean, cleaning it at least once a year.

In the event of a fire in the flue pipe or duct, switch the boiler off immediately and disconnect it from the domestic electricity mains

4.4.1. *Roof outlet via an external steel flue pipe*

One possible installation solution is to position the boiler near a perimeter wall of the home so that the smoke is discharged along an external flue pipe. Below are some provisions of standard UNI 7129 for this particular system configuration:

- Always make sure there is an inspection valve to allow periodic and efficient cleaning, as well as the venting of any condensation that may have formed;
- The chimney must under all circumstances be wind-proof and rain-proof;
- Make sure the smoke outlet duct is suitably insulated in the section that crosses the wall.



It is advisable for the smoke outlet duct, if it is completely outside, to be made of double-wall stainless steel to guarantee both greater resistance to the atmospheric agents as well as the appropriate temperature of the smoke outlet.

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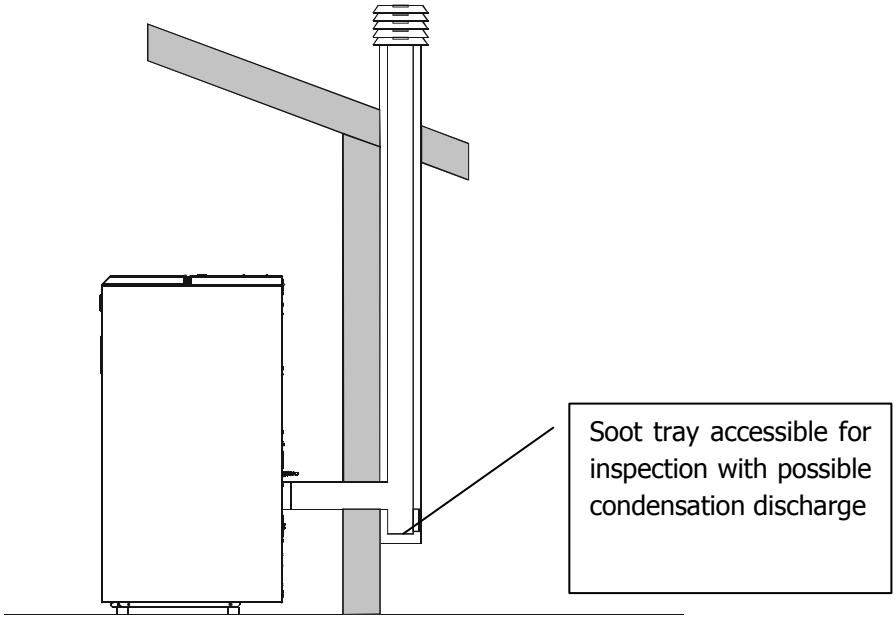
4.4.2. *Roof outlet along a traditional flue pipe*

The flue smoke can also be discharged using an existing traditional flue pipe provided it is compliant to standards (see UNI 10683).

Here is a brief list of the main characteristics highlighted in the standard that distinguish a good chimney:

- Suitable insulation and lagging especially in the external section exposed to the atmosphere;
- Constant internal cross-section (there must not be any narrower sections);
- Made with material resistant to high temperatures, to the action of the products of combustion and to the corrosive action of any condensation that may form;
- Prevalently vertical arrangement with deviations from the axis of no more than 45°;



It is compulsory to include a chamber for the collection of solid material and/ or any condensation, which can be inspected through an airtight door.

It is compulsory to observe the provisions of standards UNI 9615 and 9731 for the sizing of the chimney cross-section and, in all cases, avoid installing ducts with a cross-section of less than 150 mm.

If larger cross-sections are used a steel duct must be inserted inside the masonry duct.

Direct outlet via walls is not permitted.

The steel pipe must be suitably insulated with material which is resistant to high temperatures and sealed off from the external chimney.

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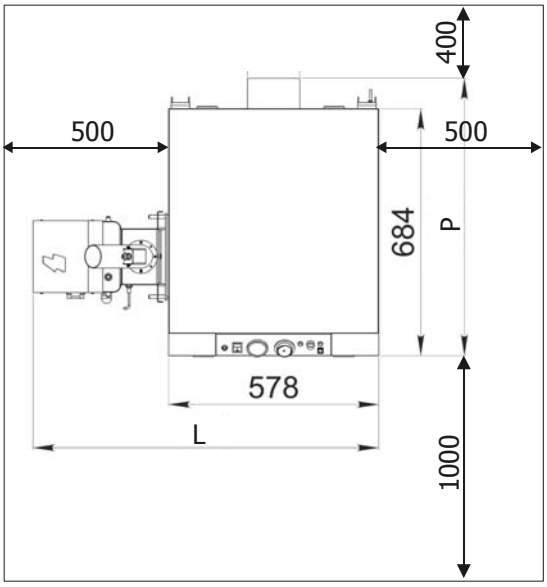
5. SYSTEM INSTALLATION PROCEDURE

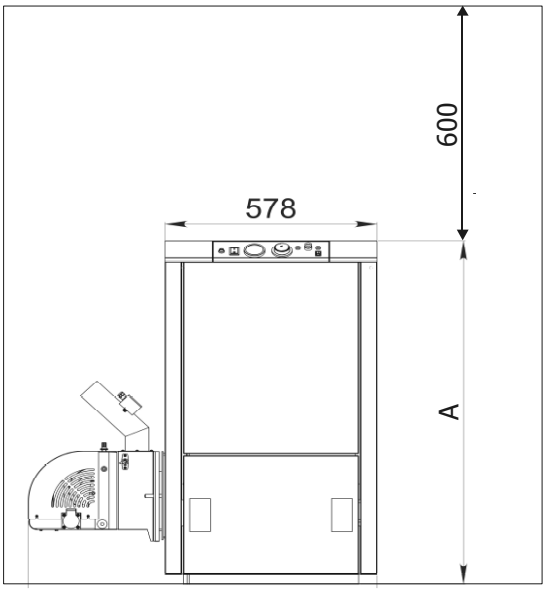
5.1. Characteristics and special requirements for fitting and installing the automatic pellet burner and the hot water pellet boiler

The automatic pellet burner is connected and fitted onto the heat exchanger of the pellet boiler. The burner installation must ensure reliable insulation between the burner and the boiler, to prevent the combustion gases from being drawn from the boiler combustion chamber into the surrounding atmosphere and the penetration of ambient air inside the combustion chamber.

5.2. Requirements for installing the system consisting of the hot water pellet boiler and pellet burner

- **the minimum clearance in front of the boiler** to allow it to be cleaned, serviced, etc. must be **1000 mm**;
- the minimum clearance permitted between the rear of the boiler and a wall must be **400 mm**;
- the minimum clearance from the side of the boiler onto which the pellet burner is connected and a wall must be **500 mm** to allow servicing and support operations on the burner and pellet hopper.
- the minimum clearnace between the opposite side (to the one where the pellet burner is connected) of the boiler and a wall must be **500 mm** to ensure easy access to the heat exchanger and facilitate the removal of the ash deposited;
- the minimum clearance between the top of the boiler and a wall (ceiling) must be **600 mm** to ensure easy access for cleaning and servicing the heat exchanger (to remove the ash, for instance);
- the minimum distance between the hot water boiler and the pellet hopper must be **1000 mm** to ensure fire-proof operating conditions and to avoid alarms.





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The boiler must be fitted in a room that is sufficiently aired in order to guarantee there is alwas a continuous flow of air for combustion.

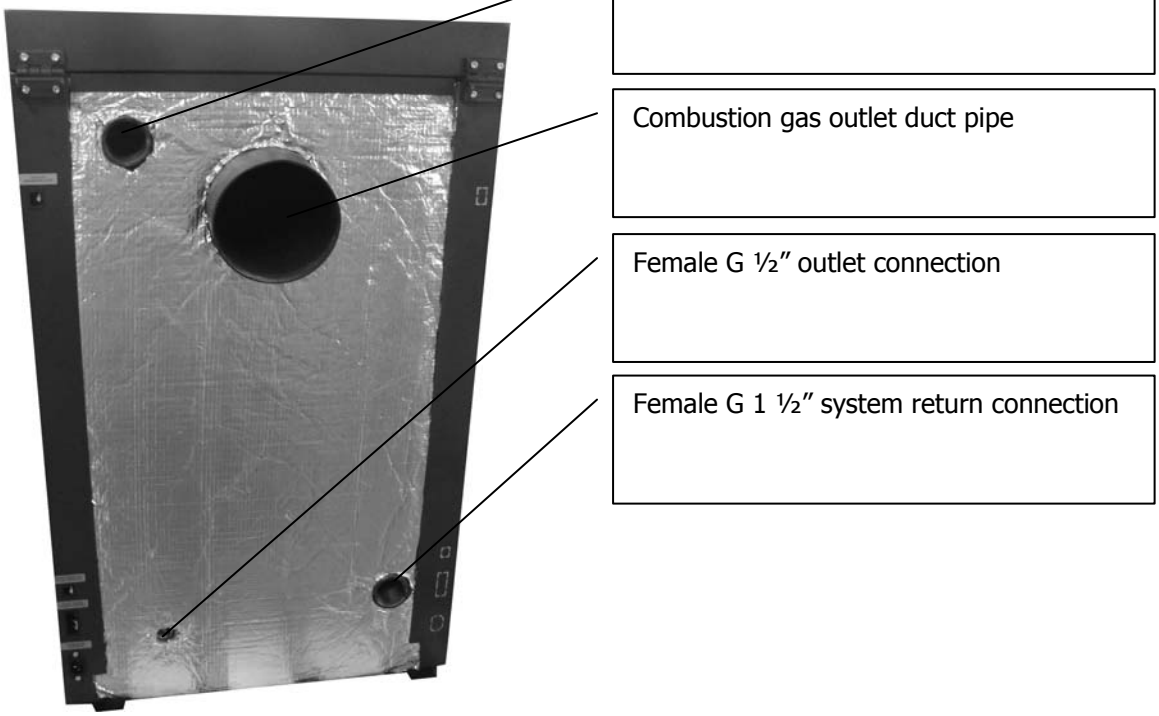
Air inlets linked to the outside must be arranged and, in compliance with the provisions of Standard UNI 10683, these must have the following characteristics:

1. A minimum free cross-section as follows: Practica 28: 168 cm^2 - Practica 33: 198 cm^2;
2. Be provided as close to floor-level as possible;
3. Be suitably protected by a wire mesh or grate so that the free cross-section for air passage is not reduced;
4. Be positioned in such a way as not to be obstructed in any way.

The correct supply of air can be guaranteed through apertures into an adjoining room, provided that direct ventilation is provided and that such a room is not a fire hazard, such as store rooms, garages or warehouses, in accordance with the regulations set out in Standard UNI 10683.

It is advisable to install the boiler in premises which do not contain appliances that do not operate in a room-sealed manner or appliances that could depressurise the room itself compared to the outside and thereby cause problems relating to poor draft for the smoke evacuation system (UNI 10683).

5.3. Hydraulic connections


Female G 1 ½" system flow connection
Combustion gas outlet duct pipe
Female G ½" outlet connection
Female G 1 ½" system return connection

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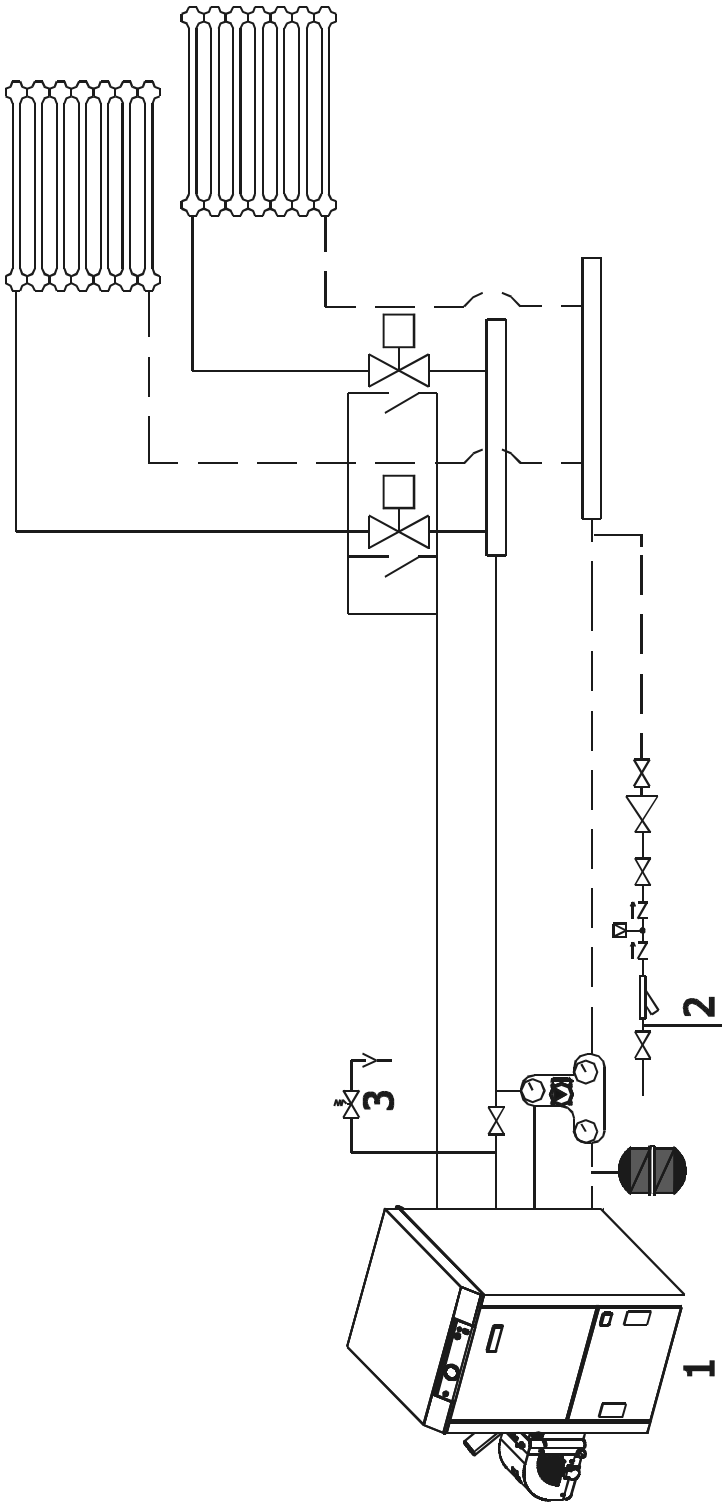
5.4. Hydraulic scheme



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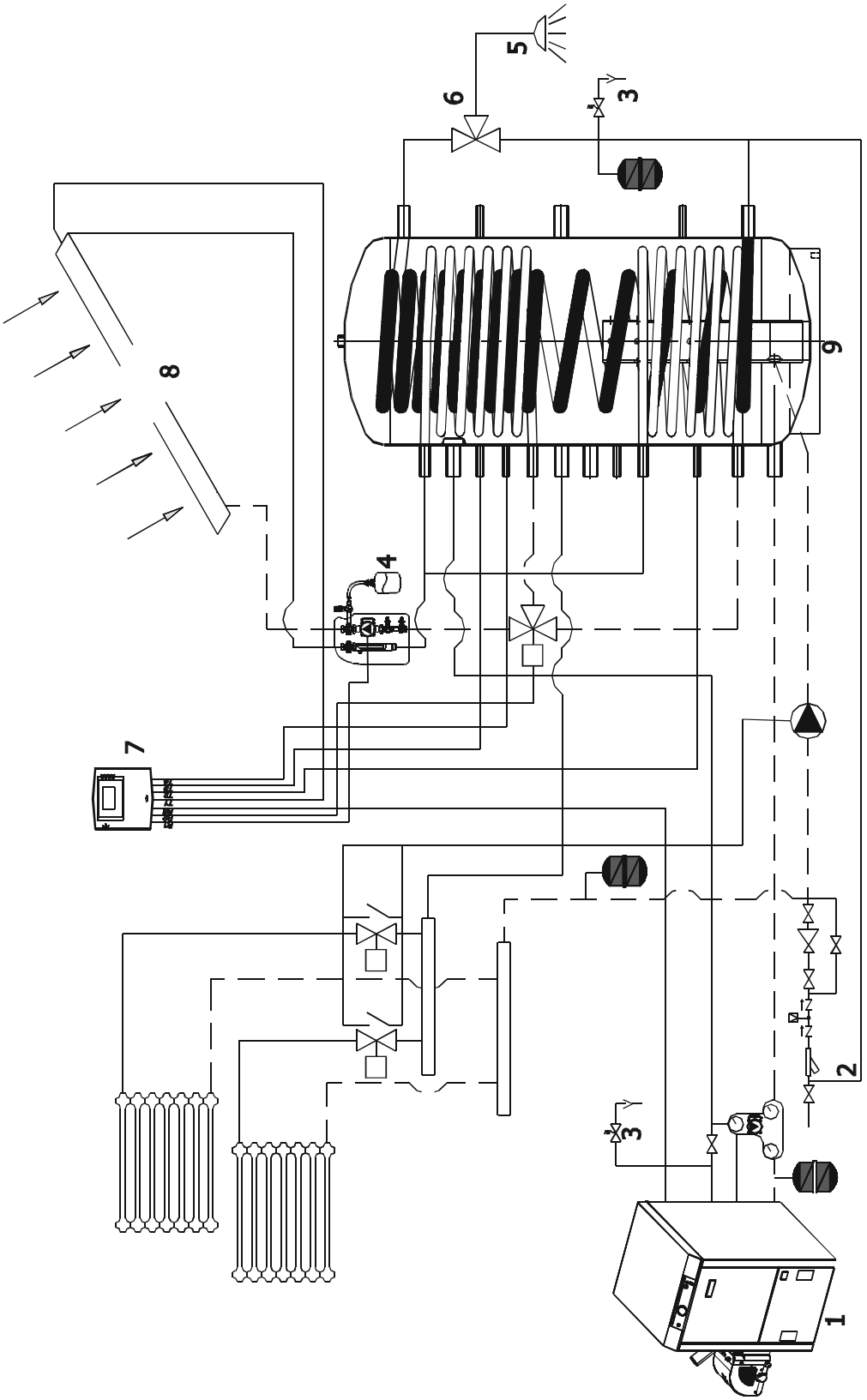

Figure 5.4.1 General hydraulic scheme recommended for connecting the "PRACTIKA" pellet boiler to the heating system.

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1	PRACTIKA BOILER	6	THERMOSTATIC MIXER
2	COLD WATER INLET	7	SOLAR CONTROL UNIT
3	SAFETY VALVE	8	SOLAR PANEL
4	SOLAR PUMP STATION	9	CYLINDER
5	DOMESTIC HOT WATER		

CAUTION: ***the system installation and the running of the tests must be specified in the relevant pellet boiler and pellet burner documents, filling in the boxes with the related data (compulsory).***

5.5. Washing the system

Connections MUST be easy to disconnect by means of swivel pipe unions. It is always advisable to fit suitable cut-off gate valves on the heating system piping.

Caution: A safety valve must under all circumstances be fitted on the system.

To prevent hazardous corrosion of the heating system and the formation of scaling and deposits, it is of the utmost importance to wash the system before installing the appliance, in accordance with standard UNI-CTI 8065, using appropriate products such as Sentinel X300 (new systems), X400 and X800 (old systems) or Fernox Cleaner F3.

Full instructions are provided with the product. However, for further details contact the manufacturer directly: SENTINEL PERFORMANCE SOLUTIONS LTD or FERNOX COOKSON ELECTRONICS.

After washing the system, you are advised to use inhibitors such as Sentinel X100 or Fernox Protector F1 to protect the system from corrosion and deposits.

It is important to check the concentration of the inhibitor after each modification to the system and each maintenance check, according to the specifications provided by the manufacturers (relevant tests are available from retailers).

The outlet from the safety valve must be connected to a collection funnel to channel any discharge if servicing is carried out. If the heating system is at a higher level than the boiler, you must install cut-off cocks on the system flow/return pipes. These cocks are provided in the optional kits.

Caution: Failure to wash the heating system and add a suitable inhibitor shall invalidate the appliance guarantee as well as the guarantee for accessories such as the pump and valve.

5.5.1. *Filling the system*

Before making the boiler connections, it is good practice to allow water to flow through the piping to eliminate any foreign bodies that could compromise the correct functioning of the appliance.

The appliance should be filled slowly to allow any air bubbles to be released through the appropriate vents within the heating system. In closed circuit heating systems, the cold filling pressure of the system must correspond to the expansion vessel pre-inflation pressure.

- In heating systems with an **open** vessel, the circulating liquid may come into contact with the air. During colder months when the heating system is in use, the end user must check the level of water circulating in the expansion vessel regularly. The water content of the recirculation system must remain constant. Practical experience shows that a regular check of the water level must be carried

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out every fortnight to keep the water content almost constant. If more water is required, perform the filling process, when the boiler has cooled down to room temperature. These precautions are designed to prevent the occurrence of heat stress on the steel body of the boiler.

- In systems equipped with an open vessel, the water pressure in the boiler (when the system is cold) must not drop below 0.3 bar;
- The water used to fill the heating system must be purified and not contain any air.

Caution!
Do not mix the heating water with anti-freeze or anti-corrosion products in the wrong concentrations! This could damage the seals and cause noisy operation.
RED will not be held liable for any damage to persons, animals or property caused by failure to observe the above instructions.

Once all the hydraulic connections have been made, check the seals under pressure by filling the boiler.

This should be done carefully, in the following sequence:

- open the air relief valves on the radiators, boiler and system;
- gradually open the system filler cock, making sure any automatic air relief valves fitted on the system are working properly;
- close the air relief valves on the radiators as soon as water starts to trickle out;
- check on the system pressure gauge that the pressure reaches a value of approximately 1 bar (this only applies for systems with a closed vessel - consult any local regulations or standards that allow it); for systems featuring an open vessel, the reintegration is automatic through the vessel itself;
- close the system filler cock and then vent any air again through the radiator air relief valves;
- check the seal on all connections;
- after starting the boiler up for the first time and the system is at the right temperature, stop the pump operation and repeat the air venting operations;
- allow the system to cool down and, if necessary, return the water pressure to 1 bar (this only applies for systems with a closed vessel - consult any local regulations or standards that allow it); for systems featuring an open vessel, the reintegration is automatic through the vessel itself;

N.B.
In systems with a closed vessel, where permitted, the water pressure in the heating system - when the system is cold - should not drop below 1 bar; if it does, open the system filler cock. This should be done with the system cold.
The pressure gauge in the system allows you to read the pressure in the circuit.

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5.6. Electrical connections

5.6.1. *General warnings*

The electrical safety of the system is only ensured when the same is correctly connected to an efficient earthing system, built in accordance with the provisions of the applicable safety standards: the piping of the gas, plumbing and heating systems are absolutely not suitable.

It is important that you check this fundamental safety requirement; if in doubt, ask for the electrical system to be checked thoroughly by professionally qualified staff, since the boiler manufacturer is not liable for any damage caused by failure to earth the system.

Have professionally qualified staff check that the electrical system is suitable for the maximum electricity consumption of the system, ascertaining specifically that the cross-section of the system cables is suitable for the power consumption of the utilities.

The use of any components which use electricity entails the observance of certain fundamental rules, such as:

- do not touch the appliance with wet and/or damp body parts and/or bare foot;
- do not pull on the electrical cables;
- do not leave the appliance exposed to the weather (rain, sunshine, etc.) unless it is designed specifically for this purpose;
- do not allow children or inexperienced persons to use the appliance.

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Connection to 230V electricity supply

The installation of the electrical accessory components of the boiler requires electrical connection to a mains at **230 V – 50 Hz**: This connection must be made according to best practice in accordance with the applicable CEI standards.

Danger!
The electrical connection must only be performed by an authorised technician.
Before making the connections or performing any servicing of electrical parts, always disconnect the electricity supply and make sure it cannot be re-established inadvertently.

Remember that an easily-accessed bipolar switch with a minimum contact opening of 3 mm must be installed on the electrical power supply line to the boiler, in order to facilitate and speed up any maintenance operations.

The power supply cable must only be replaced by authorised technical staff. Failure to observe the above recommendations may compromise the safety of the appliance.

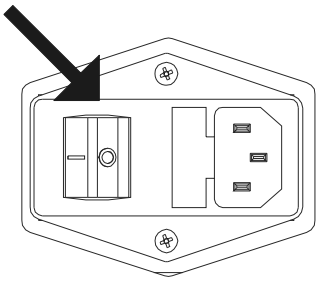
5.6.2. *Settings to make before the first start-up*

Once the power supply cable at the rear of the boiler is connected, turn the switch - again at the rear - to position **(I).**

The LED in the switch will light up.

The switch at the rear of the boiler powers the system. It should never be used to turn off the boiler.

The boiler remains turned off and after a few seconds, the display shows the initial screenshot with the word **OFF**; if you press any key, the display will show the screenshot with the word **MENU**.



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5.6.3. *Wiring diagram of the hot water pellet boiler*

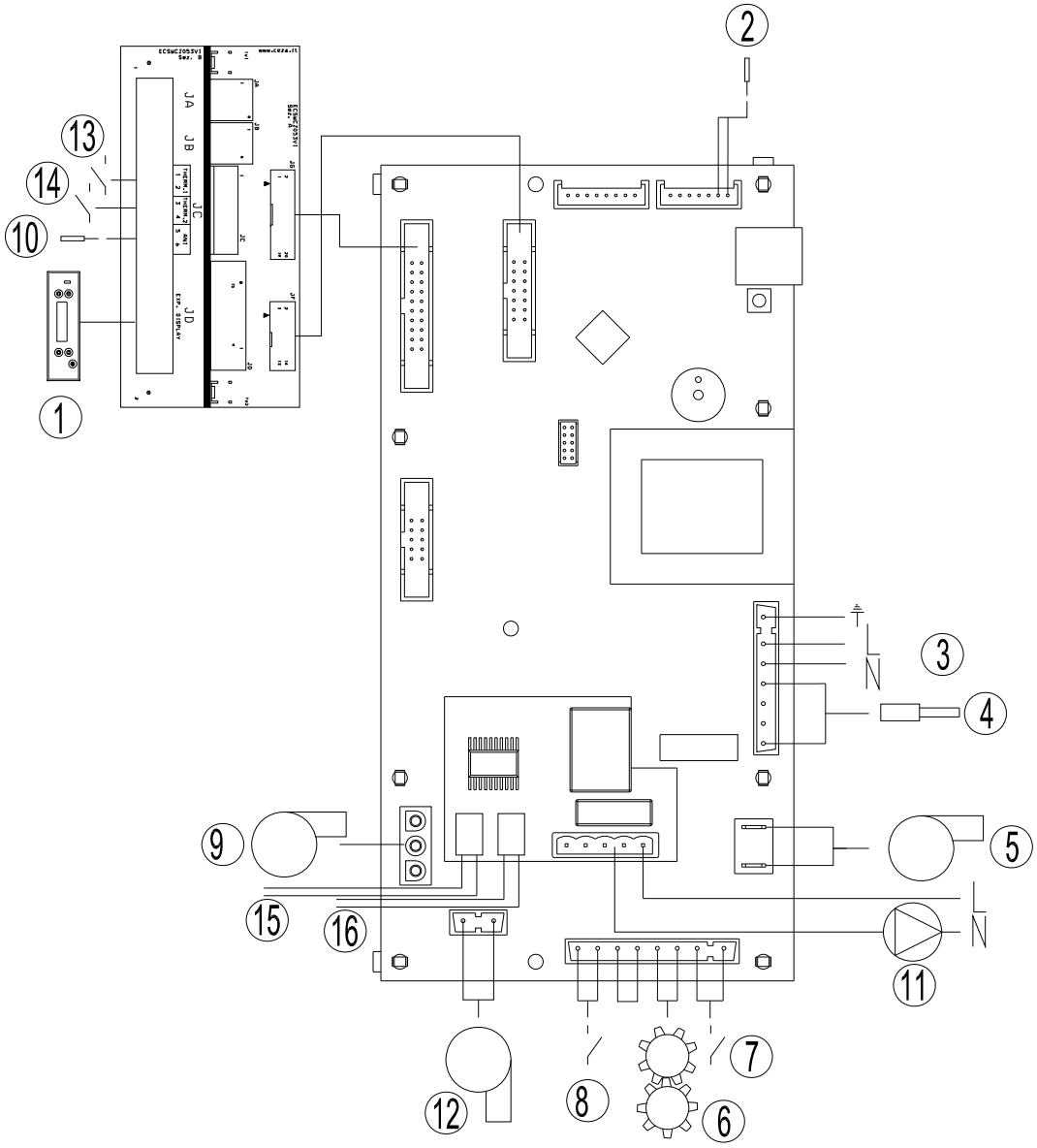

Figure 5.6.3.1. General wiring diagram of the pellet boiler control panel

1. Control panel	9. Smoke blower fan rev control
2. Smoke sensor	10. Water temperature sensor
3. Power supply	11. Pump max 230V 3A
4. Pellet igniter	12. Smoke extractor fan
5. smoke blower	13. Room thermostat with a clean contact
6. Geared motor	14. Domotic
7. Water temperature overload cut-out	15. Fault signal (N.C., max 230V 3A)
8. Tank temperature overload cut-out	16. External Aux signal (N.A., max 230V 3A)

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6. GENERAL INSTRUCTIONS

6.1. Starting the system

Press key B on the control panel.

CAUTION:

- You may notice some smoke being released by the boiler when the system is started up, especially if the chimney flue does not have appropriate draft (for instance, insufficient height of the chimney flue or obstruction of the chimney flue outlet gas duct). These gases may seep through the seal on the door or the top section of the boiler, where the combustion gas covers are situated - check and adjust their position. We also recommend that you check the condition of the chimney flue. The same process may be observed during transition periods (in spring and autumn), when the natural draft of the chimney flue does not balance the loss of the system outlet gas duct given the high ambient temperature.
- Due to the incorrect adjustment of the initial fuel dose, you may observe smoke being released by the boiler, due to the insufficient tightness of the hot water boiler seals. If this is the case, you need to adjust the burner operating parameters - this procedure can only be performed by an authorised, trained and certified technician.

6.2. Boiler operating parameters

The boiler operating mode is defined directly by setting the related thermostat set-point. Nevertheless, you need to consider that the temperature of the water circulating at the inlet affects the operating mode of the system, with consequences on reliability and efficiency.

CAUTION: the manufacturer guarantees the efficient and reliable functioning of the system consisting of the hot water pellet boiler and pellet burner only if the operating mode falls within the range of parameters specified in Table 3.2 herein.

6.3. Nominal operating mode of the system

The adjustment of the operating parameters must be made when both the boiler and the system have achieved stable thermal conditions.

N.B.:

- The temperature of the return flow of water circulating in a heating system must exceed 60°C, to avoid the formation of condensation on the internal surfaces of the boiler.
- At the initial start-up of the boiler, you may observe water vapour condensation. This process does not affect the performance of the system and does not cause any operating faults.

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6.4. Checking the system heat output

The system heat output check is performed by adjusting the heat output of the pellet burner.

CAUTION: if the type of fuel changes (for instance, by changing the category of pellets, the supplier, the size, etc.), you will then need to adjust the heat output parameters and the burner operating mode.

6.5. System shutdown

To shut down the system, **PRESS key B** on the control panel; the same one used to start the boiler. If the system remains unused for a relatively short period of time, we recommend you clean the ash that has deposited on the heating surfaces within easy reach of the heat exchanger, as well as the walls of the pellet burner combustion chamber.

CAUTION: if the system is left unused for a long period of time, then you will need to perform thorough cleaning of the heat exchanger of the hot water boiler to remove all the ash deposited. The ash deposited on the metal surfaces has a corrosive effect on carbon steel surfaces, with the ensuing shorter life span of the main modules of the system - heat exchanger of the boiler and burner. It is compuslory to have the maintenance procedures performed, along with the preventive system checks, only by trained service staff, as well as thorough cleaning at the end of every heating season. If these procedures are observed, the system is sure to have a long life span, along with high efficiency and reliability.

6.6. Emergency system shutdown

During the functioning of the system, emergency situations may arise and the component (i.e. the boiler and pellet burner) will go into alarm/failure mode. Some situations are detected by the safety devices and by the control panel of the process and the systems will automatically switch to preventive operating modes to protect the boiler and the heating system. Once the cause of the alarm has been identified, take suitable measures to return the system to normal operating conditions.

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7. INSTALLATION OF BOILER COMPONENTS

7.1. Installing the automatic pellet burner

Use the mineral wool insulation seal applied to the burner pellet. Avoid damaging the seal when connecting the burner to the boiler flange - this seal reduces the penetration of ambient air into the combustion chamber, as well as providing heat insulation, thereby reducing the backflow of heat towards the main burner module.

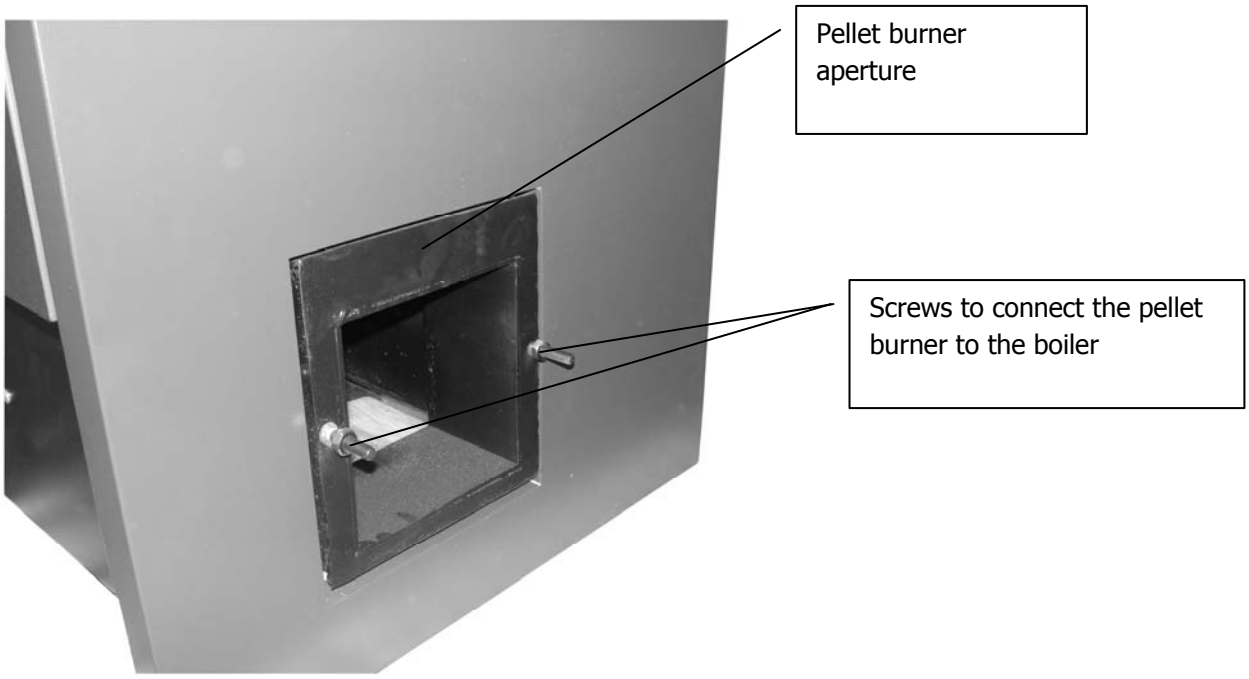

Figure 7.1.1 Side view of the aperture and flange to connect the pellet burner to the hot water boiler.

After the pellet burner has been fitted onto the boiler aperture, the subsequent step is to tighten the connecting nuts to ensure the sealed fitting of the heat exchanger onto the burner connecting flange.

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Figure 7.1.2 Side view of the pellet burner, fitted onto the boiler heat exchanger.

7.2. Installing the two ceramic plates in the boiler combustion chamber

Fit the two ceramic plates in the boiler combustion chamber - they will guide the combustion gases and allow for an efficient combustion process (*these plates are wrapped and placed in the ash tray for transport*).

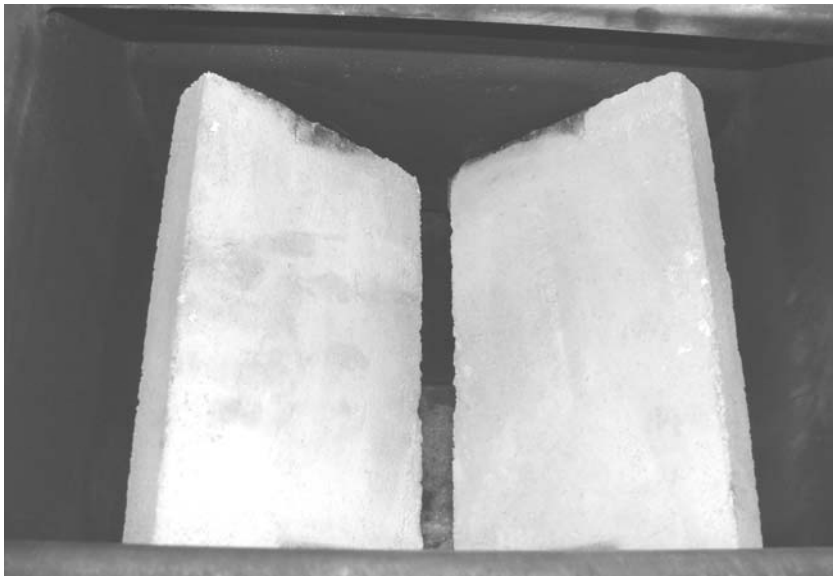

Figure 7.2.1 The ceramic elements are installed in the combustion chamber of the hot water boiler (they are placed on support plates and secured in place with special welding).

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- **Fit the second ash cover onto the bottom of the boiler convective wall**

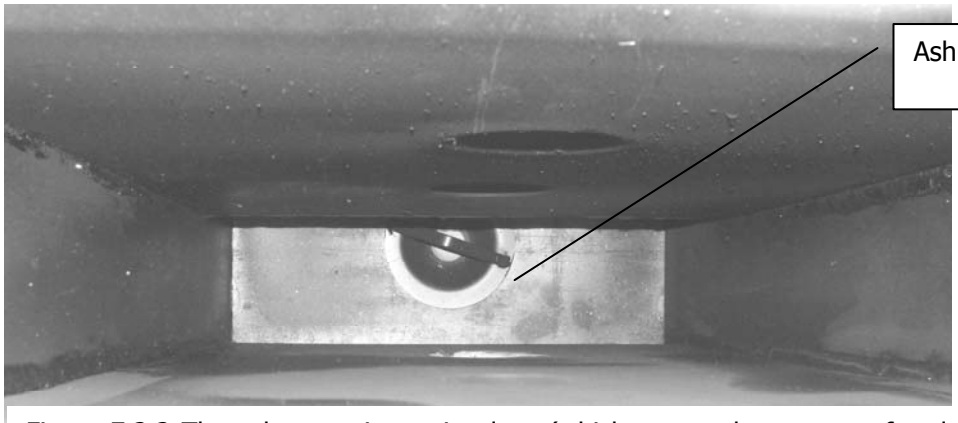
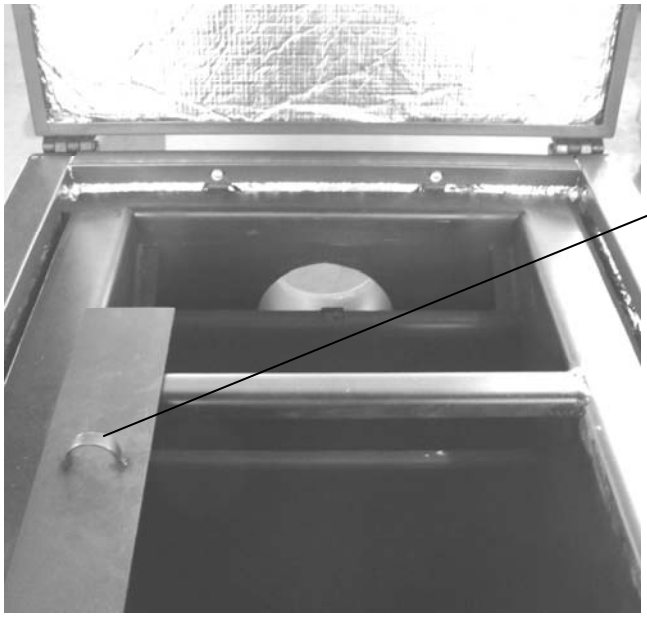


Figure 7.2.2 The ash cover is put in place (which covers the aperture for cleaning the ash between the secondary and tertiary duct of the heat exchanger combustion gases).

EXPLANATION: the correct installation of the ash cover is absolutely vital, since the correct position permits the efficient and appropriate functioning of the boiler. This is why after positioning and levelling the boiler, the position of the ash cover must be checked and inspected, as well as after any ash removal process from the internal surfaces of the heat exchanger.

7.3. Installing the combustion gas duct cover

CAUTION this cover is thermally charged, which is why it is symmetrical. We recommend you turn it regularly (for instance, turning it over after a period of boiler operation of two to three weeks).



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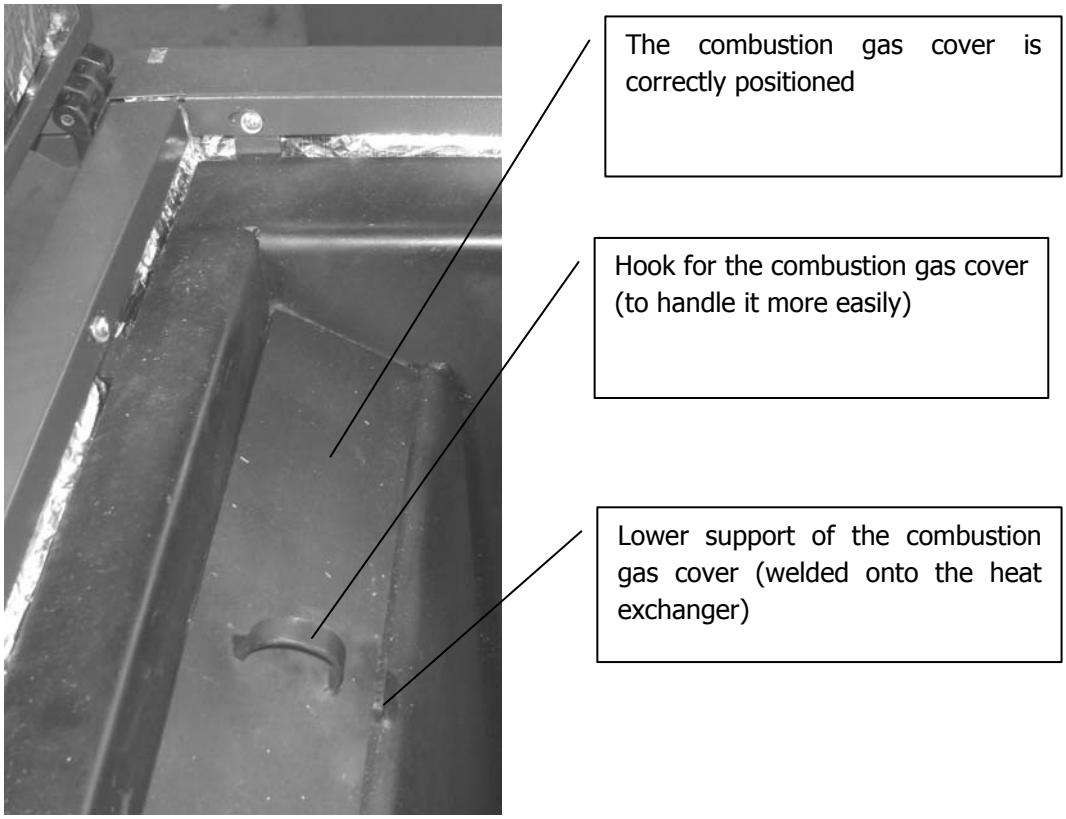
The combustion gas cover is correctly positioned
Hook for the combustion gas cover (to handle it more easily)
Lower support of the combustion gas cover (welded onto the heat exchanger)

Figure 7.3.1 The correct position of the ducting cover is illustrated

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- **Installing the combustion gas duct cover**

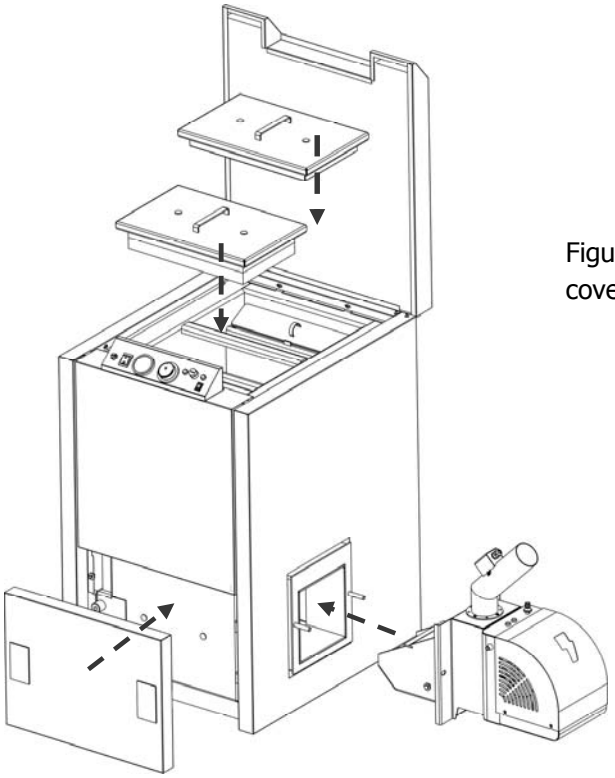

Figure 7.3.2 Position of the hot water boiler covering elements

- **Fir the heat exchanger convective ducting cover**

EXPLANATION: this cover comes with a stainless steel protective heat insulation plate.

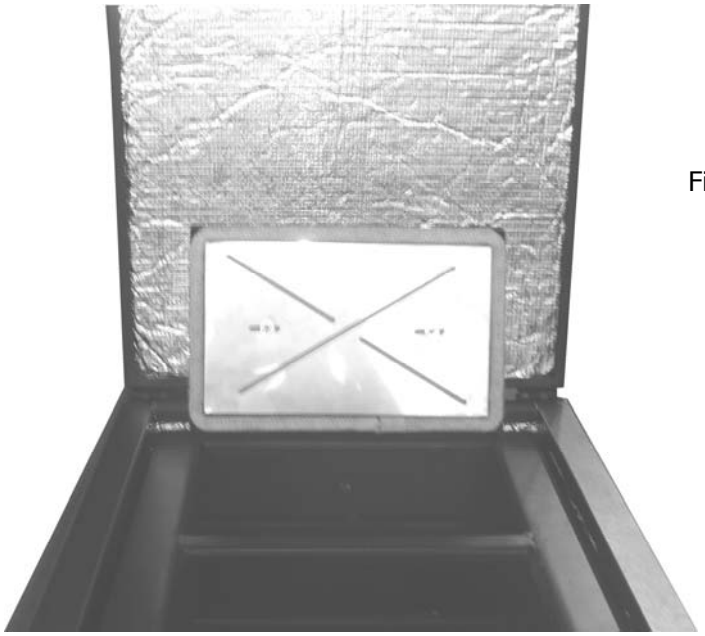

Figure 7.3.3 Cover for the convective part

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- **Fit the combustion chamber cover of the boiler heat exchanger**

  EXPLANATION: this cover has a protective heat insulation plate, to to operate at the high temperature levels of the combustion gases in the boiler combustion chamber.

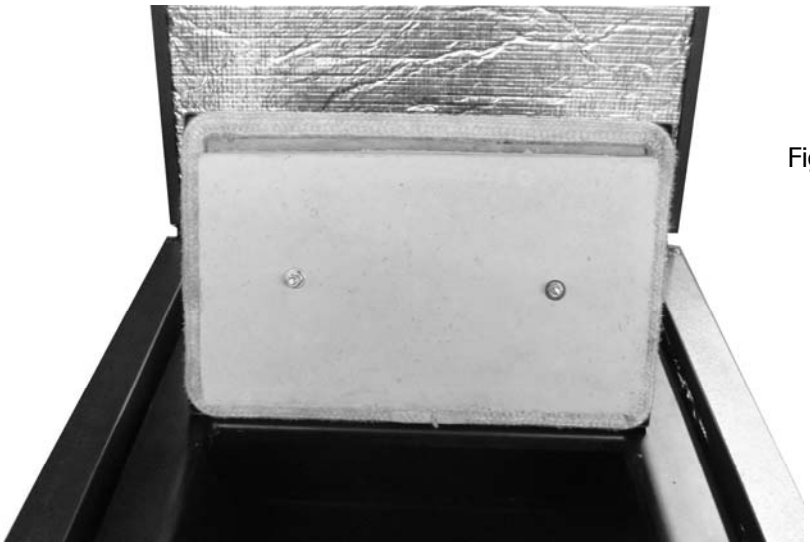

Figure 7.3.4 Combustion chamber cover

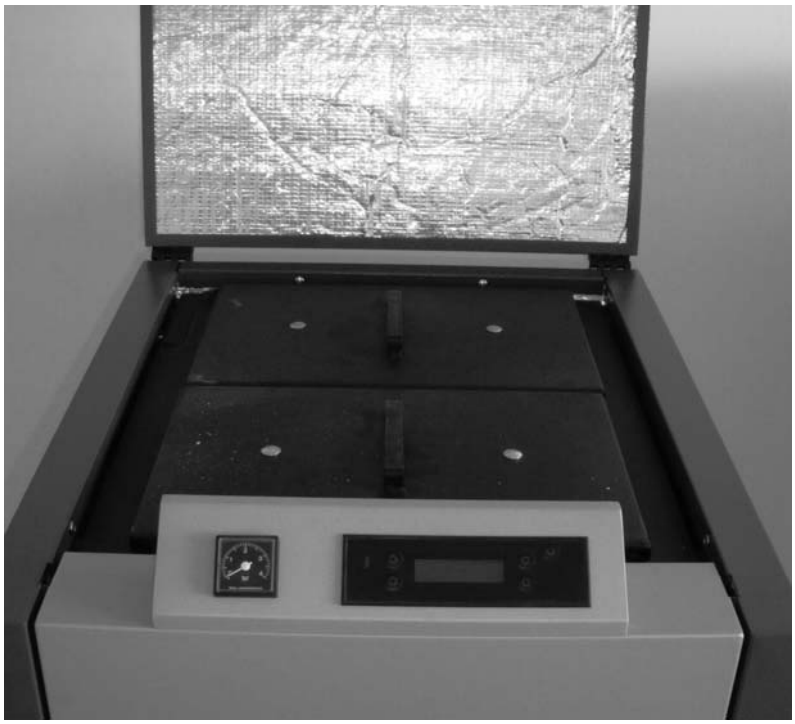

Figure 7.3.5 Both the combustion gas ducting covers are placed on the hot water boiler heat exchanger.

CAUTION: these combustion gas ducting covers are not identical; do not swap them.

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7.4. Connect the pellet burner to the hot water boiler

Connect the pellet burner cables to the boiler, inserting the burner connector into the boiler female connector.

CAUTION: these electrical connectors come with an element that prevents inadvertent detachment of the connectors - do not force them, use a suitable tool to detach them.

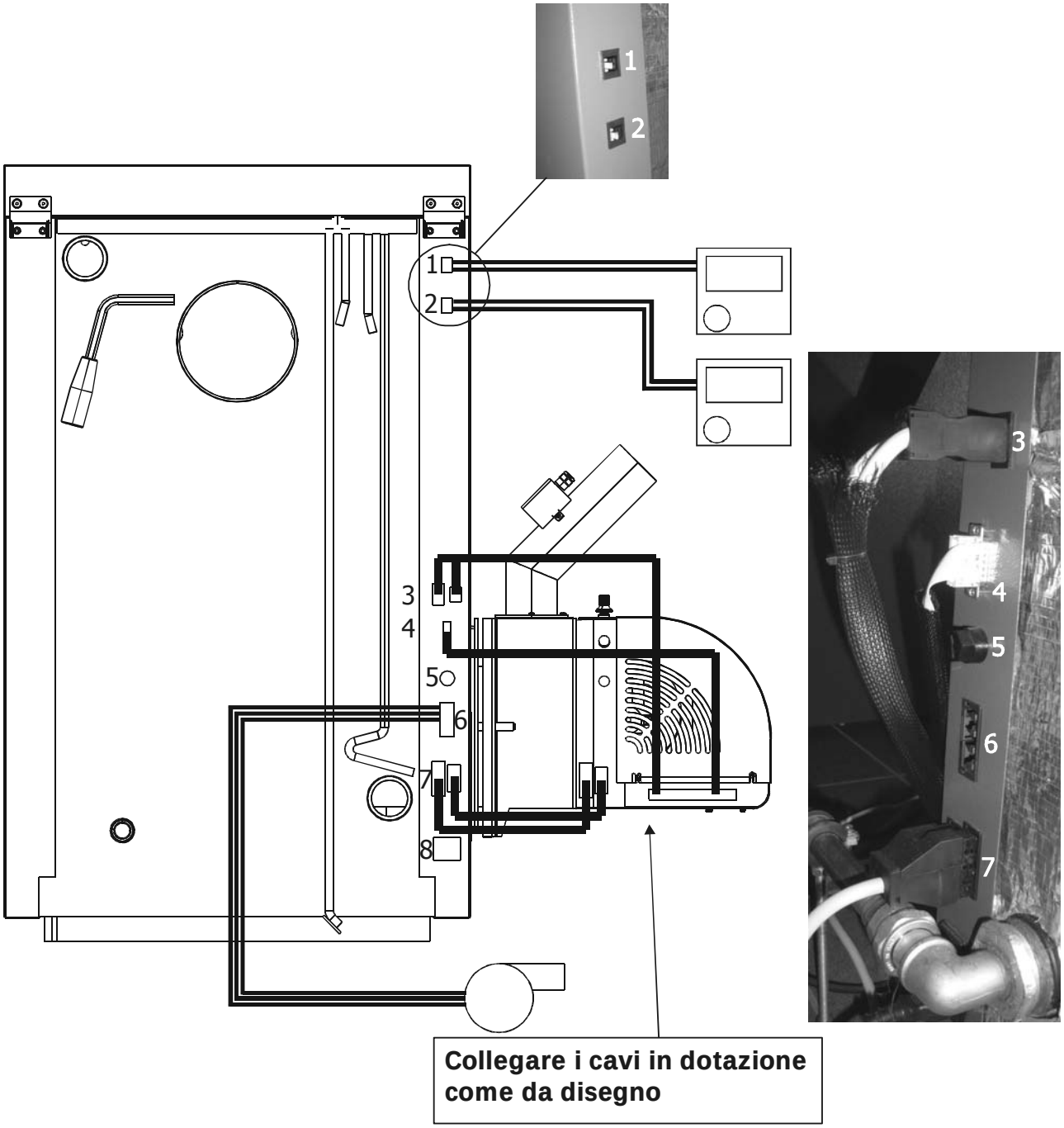

Figure 7.4.1 Side view of the rear of the boiler

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1	EXTERNAL THERMOSTAT
2	DOMOTIC
3/4/7	BOILER/ BURNER CONNECTION
5	MANUAL RESET THERMOSTAT
6	EXTRACTOR FAN (OPTIONAL)
8	POWER SUPPLY

7.4.1. *External thermostat*

The connection must be closed in order to start up the boiler.

Connect a thermostat with a clean contact. If using a storage tank connect the water thermostat. If the system flows directly to the system connect a room thermostat.

DOMOTIC

The domotic contact is a clean contact that allows remote operation of the boiler on/ off switch **("B").**

The domotic contact is sensitive to changes in the status of the clean contact and works in parrallel with the the boiler on/ off switch **("B").**

7.5. Installing the pellet conveyor auger

The angle (between the auger axis and the horizontal plane) of tilt of the conveyor auger affects productivity, i.e. the fuel flow rate obtained in the local conditions of the system installation. This is why the operating mode of the burner may need to be adjusted after a variation in the tilt of the auger. **The burner adjustment is only performed by an authorised, trained technician**.

7.5.1. *Filling the pellet conveyor auger with fuel*

The pellet burner conveyor auger is initially empty (there is no fuel in the piping). The power supply plug must be connected to the power supply, then the auger motor will operate continuously. Fill the pellet hopper and wait until the pellets start to come out of the auger outlet aperture, then disconnect the auger power supply and connect it to the female socket of the pellet burner (situated on the right side of the burner), then turn on the "PRACTIKA" pellet boiler power supply.

7.6. Connect the boiler control box to the power supply

Connect the power supply cable to the boiler and to the electricity mains.

EXPLANATIONS:

- The first time the pellet burner is started up and when the contents of the pellet hopper are exhausted, the auger must be filled with fuel. This step is explained and demonstrated to the end user by an expert technician from the support network.

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7.7. End view of the system

Figure 7.7.1 End view of the system consisting of the "PRACTIKA" hot water pellet boiler and pellet burner.

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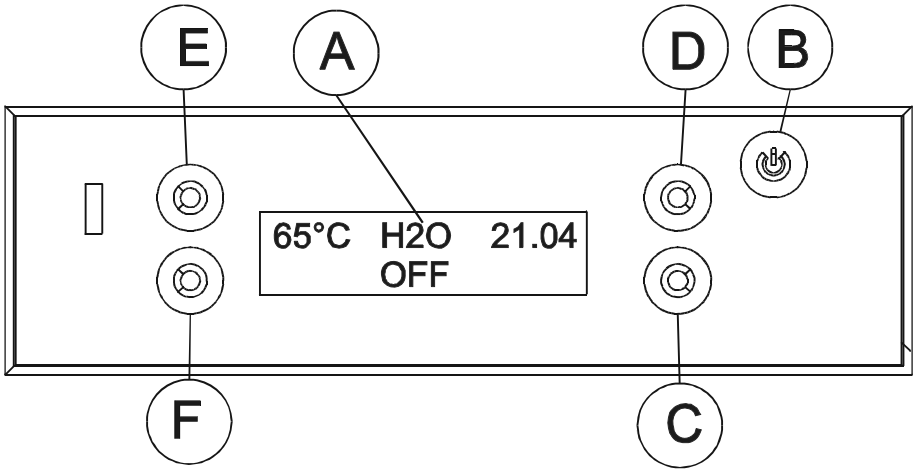
8. CONTROL PANEL DISPLAY

8.1. Control panel logic

Below is some useful information to understand the logic for browsing and using the control panel.

- The brightness of the control panel is turned off after approximately 30" if the keyboard is left unused. To turn the backlighting back on, simply press any of the panel buttons.
- The first screenshot displays the boiler operating status (ON, OFF, START-UP, SHUTDOWN...). It also shows the current time and the temperature of the water measured in the boiler.
- If you press any of the 4 keys surrounding the display (C D E F), you will enter the boiler operation set-up screenshot (maximum flame level, boiler set temperature). In this menu, the 4 keys surrounding the display assume "dedicated" functions, i.e. they are directly referred to the corresponding wording shown in the four corners of the display (e.g. the top right wording refers to key D).
- When a setting is being modified at any menu level but it is not confirmed by pressing "OK", if the keyboard is left unused for a few seconds, the initial screenshot will automatically be displayed and none of the changes will be saved.
- If the ON/OFF key (B) is pressed at any menu level, the display automatically returns to the initial screenshot (boiler operating status) without saving any changes which have not been confirmed by pressing "OK".



KEY

A. Display; shows a series of information about the boiler, in addition to the ID code for possible operating faults.
B. Start-up and shutdown key (ON/OFF) or ESC (to quit the menu).
C. Select/modify key (from the subsequent screenshot)
D. Select/modify key (from the subsequent screenshot)
E. Select/modify key (from the subsequent screenshot)
F. Select/modify key (from the subsequent screenshot)
N.B. the language can be set on the control panel.

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9. MENU STRUCTURE

The menu is designed to set/modify a series of information:

GENERAL MENU

- *TIME SETTING*
  - Hour
  - Minutes
- *SETTINGS*
  - Language
  - Auto eco (ON-OFF)
  - Back Light
  - Tone
  - °C/°F
  - Pellet Recipe
  - Smoke Blower Offset
  - Puffer / EC Pump
  - Temp. On Pump
  - AUX Off
  - Load Pellet
  - Cleaning
  - Start Pump
- *INFO*
  - Motherboard Code
  - Security Code
  - Display Code
  - Working Time
  - Working Hours
  - Smoke Blower
  - Auger Activation Time
  - Fire Sensor
- *FAULTS*
  - Service
  - Water Temp. Sensor Failure

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9.1. Hour / minutes adjustment

In the start screenshot, press any key to show the screenshot with the word **MENU**.

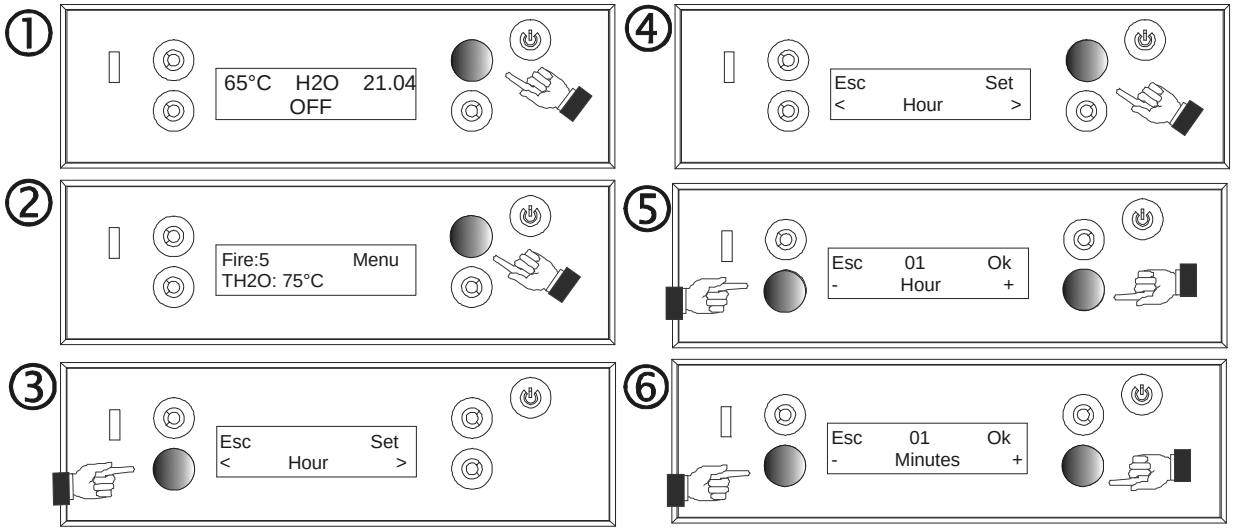
Press the key relating to **MENU** to display the word **SET**. Enter **SET** to open the programme to change the:

hour

minutes

For instance, if you need to change the hour setting, when the word **HOUR** is shown on the display, press **SET**, the hour will begin to flash in the middle of the display, then use the keys to the bottom left or right to change the hour and then the minutes in the same way, if necessary. All the changes made must be confirmed by pressing **OK otherwise they will not be saved**. The **ESC key takes you back to the previous screenshot without saving any changes made**.

If the control panel keyboard is left unused for 10 seconds, the display returns to the start screenshot without saving any changes made.



9.2. Settings Menu

9.2.1. *Language*

In the start screenshot, press any key to show the screenshot with the word **MENU**.

Press the key relating to **MENU** then use the bottom right keys to scroll through until the word **SETTING** is shown; press **SET** and again use the keys at the bottom to scroll through until the word **LANGUAGE** is shown; press **SET** again and set the desired language.

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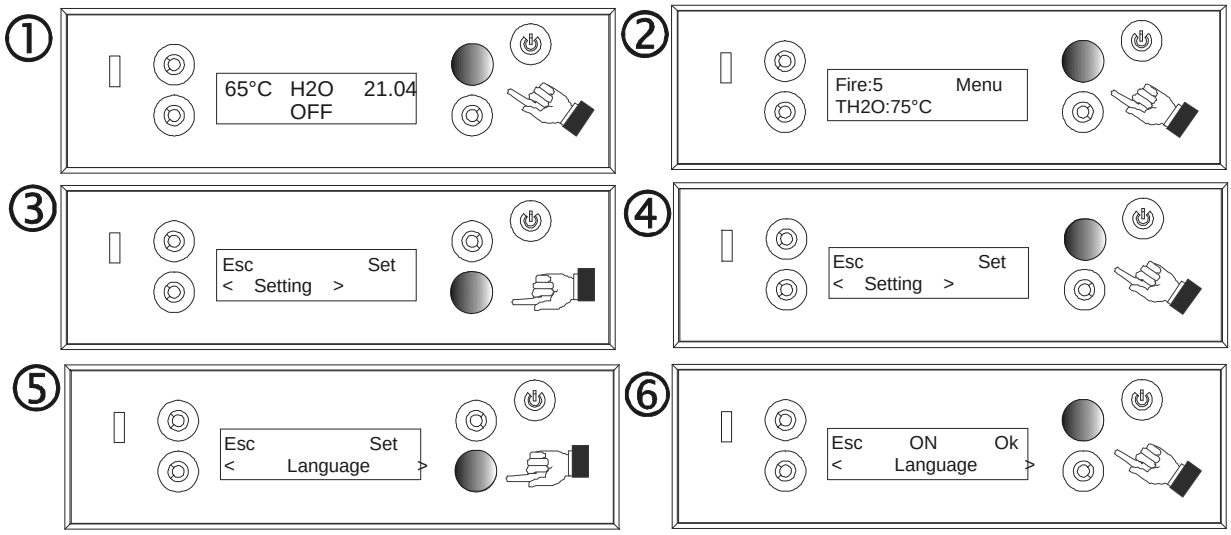
FOR EXAMPLE:



9.2.2. *ECO mode*

The boiler is factory set to AUTO-ECO mode, which means: when the external thermostat is satisfied, the boiler modulates at power level 1 for a brief period of time, after which - if the thermostat continues to be satisfied - the boiler shuts down. The boiler starts up again automatically only when the external thermostat requests heat again (not before an interval required for the boiler to cool down).

9.2.2.1. *Enabling/disabling ECO mode*

When this option is enabled, the control panel display shows the wording **ECO ENABLED.**

In the first screenshot with the word OFF, press any key to show the screenshot with the word MENU.

Using the bottom right key, scroll through until you find the word SETTINGS, press the top left key relating to SET, scroll through again with the bottom right key until the wording AUTO-ECO is shown. Select SET at the top right again and using the bottom left or right key, set OFF or ON and press OK to save your setting. When the ECO function is enabled, the start screenshot will show alternately the boiler operating status and the wording ECO ENABLED.

To disable the AUTO-ECO function, follow the same procedure.

With this function disabled, when the external thermostat is satisfied (contact open), the boiler will modulate at minimum power, shutting down only if the temperature set in the boiler is exceeded by 5°C.

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9.2.3. *Back light*

This setting enables or disables the automatic switch-off of the backlit display.

9.2.4. *Tone (Panel display: ON-OFF)*

This setting disables the sound when keys are pressed. It does not affect the alarm signals.

9.2.5. *°C/°F*

This setting allows the user to select the temperature measurement unit (°C or °F).

9.2.6. *Recipe selection procedure*

This function is designed to optimise the boiler filling according to the type of pellet being used. Indeed, since many different types of pellet are available on the market, the boiler operation may be affected by the filling variability due to the different physical characteristics of the fuel. If the pellet tends to clog up the brazier due to a fuel filling excess or due to the poor quality of the fuel itself, or if the flame is too low even at high power, the supply of pellets into the brazier can be decreased/increased:

1. Press the top right key "**D**" in the display to enter the menu
2. Using the two keys at the bottom "**F**" and "**C**", scroll through the various menus until you reach the **SETTINGS** menu.
3. Press key "**D**" corresponding to the word **SET**.
4. Using the two keys at the bottom "**F**" and "**C**", scroll through the various menus until you reach the **PELLET RECIPE** menu.
5. Confirm by pressing key "**D**" corresponding to the word **SET**.
6. Modify the value using the bottom keys "**F**" and "**C**" corresponding to the symbols **+** and **–**
7. Confirm by pressing key "**D**" corresponding to the **OK** key.

Each time the value is increased/decreased by a 5% filling at all flame levels

9.2.7. *Smoke Blower Offset*

This function is designed to modify the speed of the blower in order to adapt the flow rate of air for combustion depending on the different fuels and on the different characteristics of the smoke outlet ducts.

Each time the value is increased/decreased by a 5% filling at all flame levels

9.2.8. *Puffer / EC Pump*

Enable this function to modify the logical management of the pump to adapt it if a puffer or high efficiency pump is installed.

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9.2.9. *Temperature On Pump*

Use this function to set the temperature for the circulation pump to come on. With the boiler on, with water at a temperature below the set point, the pump starts only for 10 seconds per minute, while with temperatures above it, the operating of the pump depends on what setting was made in the previous parameter (if enabled, the pump runs continuously, if disabled the pump runs in modulation until the boiler set point is reached, after which it switches to running continuously).

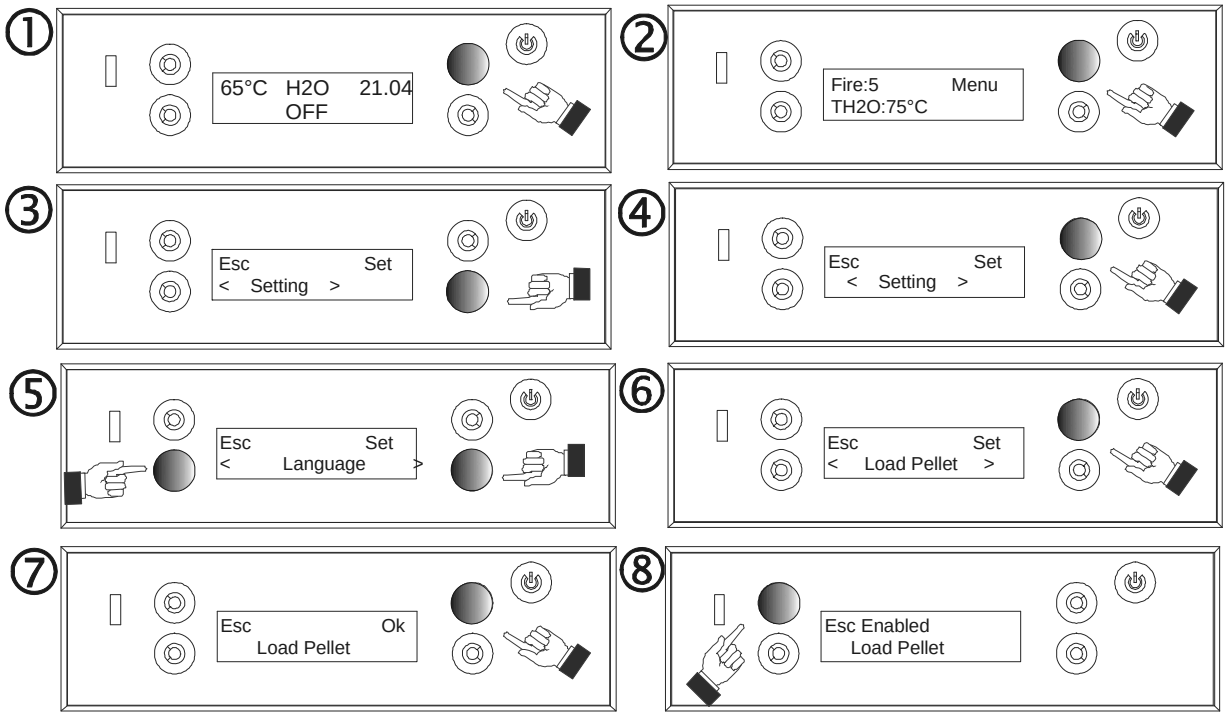
9.2.10. *AUX Off*

This item is used to set the boiler temperature above which another possible heat generator can be disabled by opening the auxiliary contact envisaged on the board.

9.2.11. *Load Pellet (ON-OFF – only shown with the boiler off)*

This parameter, which can only be enabled with the boiler off, is designed to fill the pellet auger quickly. This function can be used any time the auger is emptied because the pellets in the tank have run out (see alarm A02). It is useful to avoid failed start-ups due to an empty tank.

When the pellet begins to drop into the brazier, suspend the forced filling by pressing the Esc key and proceed with the regular start-up of the boiler.



9.2.12. *Cleaning*

This function manually starts the burner fan at maximum level, which is useful to remove any dust residue left inside the burner after mechanical cleaning. Remember to shut the door before you perform this cleaning function.

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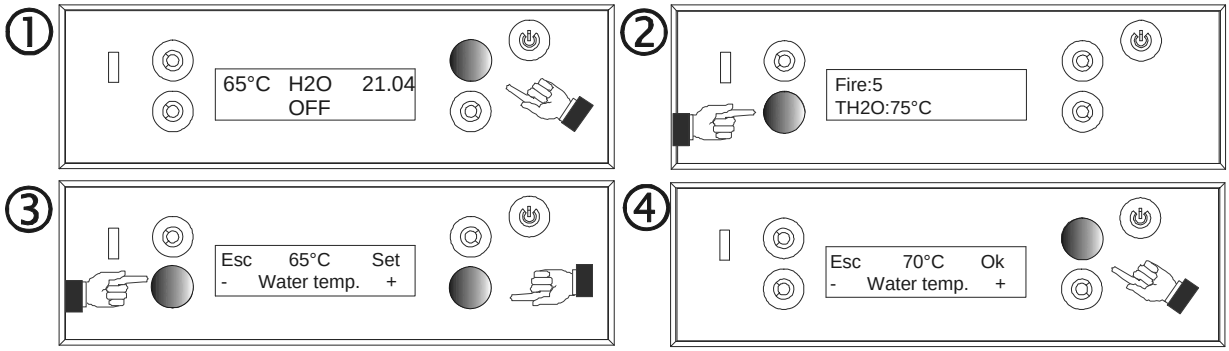
9.2.13. *Start Pump*

This function manually starts the circulation pump to run the circulation test on the system.

9.3. Adjusting the water temperature in the boiler

The water temperature is displayed in real time on the start screenshot of the control panel. The boiler set point (TH_2O) is the desired temperature of the water in the boiler. When this temperature is reached, the boiler diminishes its performance to avoid overheating. The default temperature set is 65°C but it can be set between 50°C and 80°C. If the user wishes to change this value, (s)he can do so as follows:

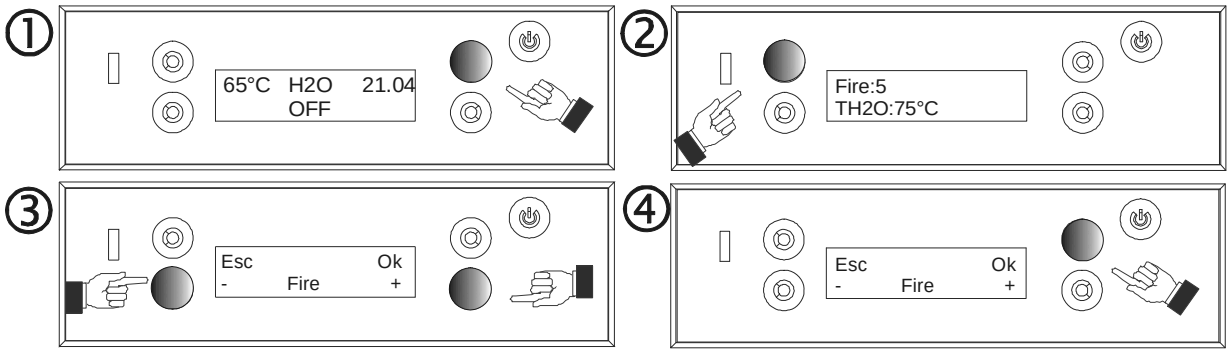
- press key D to enter the settings screenshot.
- Press key F for 1 second until the parameter setting is shown.
- Press F and C to change the value, and confirm with D.



9.4. Adjusting the maximum flame level

The maximum flame level is the maximum level the boiler can reach during modulation. If for instance the setting is Fire: 3, when the boiler modulates up, it will never exceeds the flame level 3. If the user wishes to change this value, (s)he can do so as follows:

- press key D to enter the settings screenshot.
- Press key E for 1 second until the parameter setting is shown.
- Press F and C to change the value, and confirm with D.



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9.5. First start-up

Preliminary checks
RED will not be held liable for any damage to persons, animals or property caused by failure to observe the above instructions.

Before starting the boiler, it is advisable to check that:

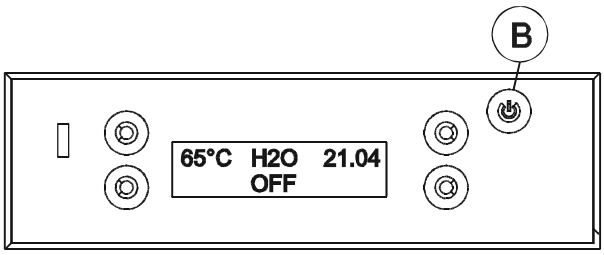
- the drawing of combustion air and the smoke outlet system are working properly as set out in the applicable standards in force;
- the boiler is fitted with all the safety and control devices set out in the applicable standards in force;
- the supply voltage of the electrical accessory components of the boiler is 230V - 50Hz;
- the system is full of water;
- any cut-off gate valves on the system are open;
- the external main switch is on;
- the safety valve on the system is not blocked and that it is connected to the sewer drain;
- there are no water leaks;
- the ventilation conditions and minimum clearances for maintenance to be performed are guaranteed.

9.5.1. *Start-up/shutdown from the control panel*

The boiler is started up and shut down by **pressing key B on the control panel for 1 second.**

After a start-up phase of about 15 minutes, the boiler runs regularly.

After the boiler is shut down by pressing key **B** on the control panel, the cooling procedure begins, which includes the suspension of fuel filling, the cleaning of the brazier and the continuation of ventilation until the boiler has cooled down sufficiently; this phase can last from 20 to 40 minutes depending on how long the boiler was on for.



9.5.2. *Note regarding first start-up*

The first start-up may actually fail, since the auger is empty and does not always manage to fill the brazier up quickly enough with enough pellets for the flame to ignite normally

If the auger is empty, the manual pellet filling can be enabled manually on the control panel (see "load pellet" function – 9.2.11).

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SILENCE THE ALARM ON THE CONTROL PANEL (see paragraph 10.2). REMOVE THE PELLET LEFT IN THE BRAZIER AND REPEAT THE START-UP PROCESS

If, after a repeated number of start-up attempts, there is still no flame despite a regular supply of pellets, check the brazier is correctly seated, as it must be **seated perfectly inside its slot and free of any ash deposits**. If nothing untoward is detected, this means there may be a problem with the boiler components or ascribable to incorrect installation.

REMOVE THE PELLET FROM THE BRAZIER AND CALL FOR AN AUTHORISED RED TECHNICIAN.

9.6. Connecting the room thermostat or storage tank thermostat

The boiler should be connected to an external thermostat with a clean contact. (see figure par.7.4.1)

Thermostat and related electrical cables are under the user's responsibility. We recommend these connections be made by a specialised technician.

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10. SAFETY DEVICES

The boiler is fitted with the following safety devices:

- **PHOTORESISTOR**

  It detects the presence of a flame.
- **PELLET THERMOSTAT (ALARM A03)**

  If the temperature exceeds the safety value set, it stops the functioning of the boiler immediately and the sensor needs to be reset in order to restart the boiler, only once the same has cooled down.
- **BOILER OVERTEMPERATURE THERMOSTAT (ALARM A18)**

  If the temperature of the water approaches the shutdown temperature (95°C), the boiler shuts down.
- **WATER TEMPERATURE SENSOR (ALARM A17)**

  When the water temperature reaches 80°C, the boiler begins to drop in power gradually to 85°C. If 85°C are exceeded, this triggers a safety shutdown; the boiler restarts when the body has cooled down properly.
- **ELECTRICAL SAFETY**

  The boiler is protected against violent current surcharges by a general fuse situated in the power supply panel at the rear of the boiler. Other fuses to protect the electronic boards are situated on the latter.
- **SMOKE BLOWER BREAKAGE (ALARM A08)**

  If the blower fan stops, the electronic board promptly suspends the supply of pellets and the alarm is displayed.
- **GEARED MOTOR BREAKAGE (ALARM A11)**

  If the geared motor stops, the boiler continues to function until the minimum cooling level is reached.
- **BRIEF POWER FAILURE**

  In the event of a power failure during operation, when the power returns, the boiler cools down and then restarts automatically.
- **FAILED START-UP (ALARM A01)**

  If a flame fails to ignite during the start-up phase, the boiler alarm is triggered.
- **ANTIFREEZE FUNCTION**

  If the sensor inside the boiler detects a water temperature of less than 5°C, the circulation pump is automatically started to prevent the system from freezing.
- **ANTI PUMP SHUTDOWN FUNCTION**

  If the pump is left unused for an extended period of time, it is started at regular intervals for one minute every 24 hours of inactivity, to prevent it from shutting down.

THE SAFETY DEVICES MUST UNDER NO CIRCUMSTANCES BE TAMPERED WITH

The boiler can only be started up after the cause that triggered the safety system has been identified, thereby restoring the automatic functioning of the sensor. To troubleshoot the fault, please consult this manual, which illustrates - depending on the error message displayed by the boiler - how to remedy it.

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CAUTION!

If the boiler is NOT used as instructed herein, the manufacturer will not be held in any way liable for any ensuing personal harm and/or property damage. In addition, the manufacturer will not be held in any way liable for personal harm and/or property damage due to failure to observe all the rules specified in the manual, and also:

- **In the performance of maintenance, cleaning and repair work, all the necessary measures and/or precautions must be taken.**
- **Do not tamper with the safety devices.**
- **Do not remove the safety devices.**
- **Connect the boiler to an efficient smoke outlet system.**
- **First check that the room in which it will be installed is suitably ventilated.**

10.1. Alarm signals

In the event of an operating fault, an alarm is triggered and the boiler shuts down, informing the user which type of fault has been detected via a 3-digit code that is displayed permanently on the boiler control panel (along with a brief description of the type of alarm).
The table below describes the possible alarms signalled by the boiler, and the respective code displayed in the emergency panel, along with useful suggestions on how to remedy the problem.

WORDING DISPLAYED	TYPE OF FAULT	SOLUTION
A01	Fire failed to ignite	Check the pellet level in the tank. Check whether the brazier is correctly seated and does not have any evident incrustations of non-combusted fuel; Check whether the pellet igniter heats up.
A02	Abnormal fire extinguishing	Resulting from the fire extinguishing due to lack of fuel (tank empty).
A03	The temperature of the pellet tank exceeds the safety threshold envisaged. Overheating of the boiler body	The boiler body is too hot because the appliance has operated for too long at maximum power or because it is poorly ventilated or because the air fans are faulty. When the boiler has cooled down sufficiently, press key B on the control panel. Once the alarm has been silenced, the boiler can be restarted as normal.
A08	Smoke blower faulty	Check that the smoke blower fan is clean to make sure no dirt is clogging it. If this is does not resolve the problem the smoke blower is faulty. Call an authorised service centre for it to be replaced.
A10	The pellet igniter is faulty	Contact an authorised service centre to have the component replaced.

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A11	Pellet supply fault	Contact an authorised service centre to have the component replaced.
A13	Electronic board fault	This alarm is triggered in the event of a faulty electronic board. Contact a service centre to have the component replaced.
A18	Temperature of the water tank too high	This alarm is triggered if the water inside the system does not circulated and the temperature therefore rises. Check the pump and release it if it has shut down. If necessary, contact a service centre to have the component replaced.
Service	Regular maintenance advice	If this message is displayed at start-up the preset operating time before maintenance has expired and maintenance is due to be carried out. Contact a qualified RED technician.

10.2. Silencing alarms

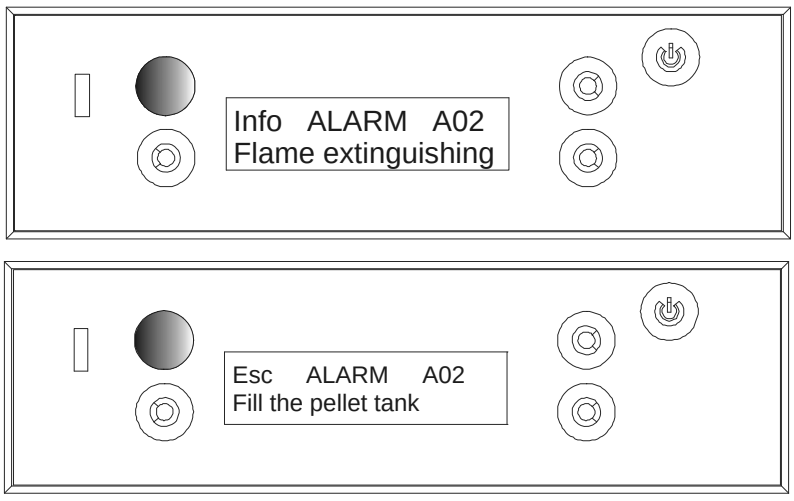
If an alarm is triggered, hold down the ON/OFF key a few seconds to restore the boiler to normal functioning. After a brief period during which the boiler checks whether the cause that triggered the alarm has subsided, the boiler quits alarm mode and can be restarted.
Boiler shutdown

The causes for the mechanical shutdown of the boiler are as follows:

- Abnormal fire extinguishing **("A02")**

WHAT TO DO:
If alarm **"A02"** is displayed: the boiler switches off because there is no fuel in the boiler (tank empty). Fill the fuel tank, cancel the alarm and restart the boiler.

Only once the cause of the shutdown has been permanently remedied can the boiler be restarted.



For example: Alarm on the control panel display

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11. TROUBLESHOOTING

In the event of a system fault, the problem needs to be identified, along with a suitable solution. Some faults are described in the pellet burner instruction manual, along with the related proposed solution. This document contains additional information, which will come in handy for both the end user and the service technicians.

No.	FAULTS	CAUSES	SOLUTIONS
1.	Low temperatures in the heated rooms	Insufficient heat output	The burner operating parameters need to be adjusted.
		Low set point temperature of the boiler operating thermostat	The set point of the boiler operating thermostat needs to be raised (up to 90°C)
		Low temperature set point of the remote room thermostat (where connected)	The room thermostat set point needs to be raised
2.	High temperatures in the heated rooms	High set point temperature of the boiler operating thermostat	The boiler thermostat set point needs to be lowered
		High temperature set point of the remote room thermostat (where connected)	The room thermostat set point needs to be lowered
3.	The boiler is working but there is no combustion process	The "START" signal is missing	You need to check the status of the pellet burner operating signal - *check the room thermostat, the "START" switch, the boiler operating thermostat.*
4.	Difficulty igniting fuel	Poor quality fuel	You need to replace the fuel, most likely due to its high humidity content, which could be above the value required for nominal burner operation.
5.	Emergency boiler overheating	No heat consumption or incorrect adjustment of the boiler parameters, or poor functioning of the heating system	You need to check the correct functioning of the heating system and if necessary make the correct adjustment to the operating parameters of the pellet burner and/or system control valves - *these operations must be performed by an authorised technician*. When the boiler has cooled down to ambient temperature and the cause of the boiler overheating has been remedied, unscrew the protection cap from the emergency overheating thermostat and press the rod until the thermostat is reset, then screw the cap back on.
6.	Failed fuel ignition	No fuel in the hopper	The fuel hopper must be filled

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		No fuel in the burner	You can reset the burner operation manually. Check whether the ignition process needs to be prolonged - *this adjustment must only be made by an authorised technician*.
		The fuel is in the burner but the latter is not on, or the fuel has burned out and the combustion process has died out.	If the electric heater is not working or is faulty, it needs to be replaced. If the heater is working, then you need to increase the ignition time for the initial fuel mass - *this adjustment must only be made by an authorised technician*.
		Operating fault or malfunctioning of the burner photocell	You need to check or replace the burner photocell - *see the pellet burner instruction manual*.
	The flame appears to be "opaque" and smoke is coming out of the chimney flue	Poor quality pellets	It is advisable to replace the fuel, most likely the humidity content exceeds that required.
		Incorrect adjustment of the pellet burner operating parameters	You need to perform the correct adjustment of the pellet burner operating parameters to achieve an efficient combustion process - *the adjustment must be made by an authorised technician*.
7.	Unburned fuel present in the boiler ash tray	Fuel combustion process inefficient	You need to make the correct adjustment of the burner operating parameters - *the adjustment must be made by an authorised technician*.
9.	Water vapour condensation on the surfaces of the heat exchanger	Low temperature of the water inlet flow	Check the adjustment of the heating system. You need to adjust the set point temperature, which controls the circulation pump of the heating system. The thermostat set point must be adjusted to a value above 65°C.
10.	Combustion gases are released into the boiler room after a certain period of operation	The cover seals, the combustion chamber seal and possibly the seal between the pellet burner and the boiler are damaged and need to be replaced.	You need to check and tighten the seals, or replace them - *this procedure must be performed by an authorised technician*.
11.	Heat warping of the pellet burner combustion chamber	Overheating of the pellet burner	You need to modify the pellet burner operating parameters or replace it if necessary.
12.	Other faults not described above		You need to call for an authorised technician and have the boiler serviced if necessary

Table 11.1. Description of faults in the system consisting of the hot water pellet boiler and pellet burner; causes and repair methods

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12. CLEANING AND MAINTENANCE

Inspection and maintenance, carried out to the highest standard at regular intervals and using only original parts, are of primary importance for fault-free operation and long life cycle of the boiler.
Boiler maintenance is compulsory pursuant to the applicable Laws in force and it must be performed with the frequency set out in Italian Presidential Decree 412 of 26th August 1993 and subsequent amendments regarding the type of fuel used and the boiler power rating.

Failure to perform Inspections and Maintenance may cause material damage and personal injury.

For this reason, you are advised to take out an inspection and maintenance contract.

Inspection is necessary to determine the current condition of an appliance and to compare it with the nominal condition. This is carried out through measurements, checks and observations.

Maintenance is necessary to eliminate any inconsistencies between the actual condition of the appliance and the nominal condition. This is carried out through standard cleaning as well as configuring and (if necessary) replacing individual components subject to wear.

These maintenance intervals and their frequency are determined by the specialist, based on the condition of the appliance ascertained during inspection.

12.1. Instructions for inspection and maintenance

To ensure the long-term operation of your appliance and avoid deteriorating its performance, only original RED spare parts must be used.

Before carrying out maintenance operations, always perform the following operations:

- Switch the boiler off
- Disconnect the main switch.
- After the boiler has been switched off, wait for it to cool down properly.

  You need to wait for the temperature of the water circulating in the boiler drops and for the surfaces of the heat exchanger to have cooled down to safe levels. At this stage, the ash removal procedure can begin.

Once all the maintenance work has been completed, always perform the following operations:

- Reconnect the appliance to the electricity mains and switch on the main switch.
- Check that the appliance is perfectly sealed both on the smoke and water fronts.

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12.2. Body maintenance

Danger!
Before servicing the boiler, make sure both the boiler itself and its components have cooled down.

Warnings

Never drain the water from the system, even partially, except if you really have to.

Check regularly the correct functioning and the condition of the smoke outlet duct and/or device.

In the case of work or maintenance on structures placed near the smoke ducts and/or smoke outlet devices and their accessories, switch off the appliance and, when the work is complete, check its efficiency.

Do not clean the boiler and/or its parts with easily flammable products (such as petrol, alcohol, etc.).

Do not leave flammable containers in the room where the boiler is installed.

Do not clean the thermal power plant when the boiler is in operation.

At the end of every heating period, inspect the boiler in order to ensure the system is perfectly efficient.

Accurate maintenance always makes for savings and increased safety.

Important!
Use pigging equipment and aspirators for cleaning; if you use cloths, make sure you retrieve them all.

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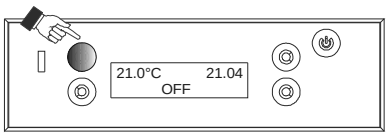
12.3. Training and end user demonstration of maintenance and adjustment procedures

Cleaning the exchanger and the compartment under the brazier is a simple yet very important operation to ensure the performance declared by RED at all times.

Every two or three days, we therefore recommend you clean the internal heat exchanger, following these few simple steps in order:

- **Enable the "CLEANING" function** – with the boiler switched off, press button **E** on the control panel for 2 seconds. This procedure starts the smoke blower on maximum in order to expel the soot that becomes dislodged when the exchanger is cleaned.
- **Disable the "CLEANING" function** by pressing button **E** on the control panel again.



"Cleaning" function

You must read this manual carefully, long with the main characteristics of the system modules. You need to be familiar with the operating process of the boiler and of the burner, i.e. the start-up, the operation, the shutdown, the ash removal, etc.

The maintenance procedures to operate the boiler efficiently and to maintain reliability at top levels must be illustrated and instructed to the end user. The fitter must also demonstrate and teach the end user how to change the operating parameters of the boiler control module in order to operate the appliance with different modes and heat outputs, depending on the local heating requirements:

- **Filling the fuel hopper** – the fuel is poured into the system hopper. The pellet auger draws the fuel from the hopper and carries it to the main module of the pellet burner.
- **Ash removal procedure** – it is advisable to stop the pellet burner regularly (at least once every 72 hours of operation of the system), wait until the system has cooled down (at least 30 minutes) and wipe away any ash residue in the heat exchanger of the hot water pellet boiler, scraping it away manually and wiping off the ash. Remove the ash residue collected in the purpose-provided ash tray of the boiler if necessary. If you observe this procedure, you will ensure efficient heat exchange and retain the optimal operating conditions of your boiler.

CAUTION:

regular removal of any ash residue deposited on the heat exchange surfaces of the boiler ensures prolonged and reliable operation, as well as efficient and economical performance of the appliance.

- **Procedure for removing ash from the pellet burner grille** – after the system has been switched off and the burner has cooled down to ambient temperature, open the boiler combustion chamber flap, remove the burner grille, wipe off any ash residue, reposition the burner grille and then close the flap.

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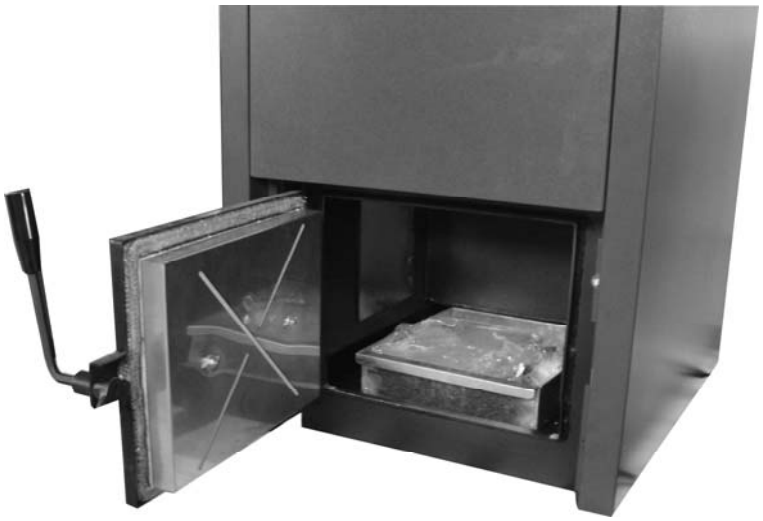

Figure 12.3.1 Removing the ash tray from the combustion chamber and cleaning it.

Open the combustion chamber flap and remove the ash tray, situated at the bottom of the boiler, where the ash residue is collected. Pour the ash residue into the heat-resistant container (or another suitable container), reposition the ash tray, close the flap, also check the position and seal of the top cover of the heat exchanger.

CAUTION:

regular removal of any ash residue deposited on the heat exchange surfaces of the boiler ensures prolonged and reliable operation, as well as efficient and economical performance of the appliance.

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12.4. Recommendations and obligations

Caution!

- After every cleaning process, the boiler needs to be checked in terms of the correct positioning of its components, the seal of the covers and the boiler functioning.
- At the end of the heating season, you need to remove any ash in the boiler thoroughly, since mineral ash acts like a corrosive reagent and reduces the reliability of the boiler. We recommend you remove all the pellets (or other fuel, where used) from the fuel hopper since the pellets may absorb humidity from the ambient air and clog the fuel conveyor auger, cause start-up failures, etc.

The ash removal procedure described above is **COMPUSLORY. Failure to perform it will invalidate the guarantee**. If the boiler maintenance and ash removal procedures are not performed, the efficiency and reliability of the boiler performance could be compromised, and lead to operating faults (for instance, clogging up the ash removal mechanism, obstructing the smoke blower fan etc.).

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